DOCUMENT RESUME

ED 243 660 SE 044 391

AUTHOR	Chakroff, Marilyn S.; DuBois, Random
TITLE	Marine Fisheries Case Studies. Appropriate Technologies for Development. Case Study No. 1.
INSTITUTION	TransCentury Corp., Washington, D.C.
SPONS AGENCY	Peace Corps, Washington, DC. Information Collection and Exchange Div.
PUB DATE	Sep 82
CONTRACT	79-043-1029
NOTE	128p.
AVAILABLE FROM	Peace Corps, Information Collection & Exchange, Office of Program Development, 806 Connecticut Avenue, NW, Washington, DC 20526.
PUB TYPE	Reports - Descriptive (141) -- Historical Materials (060) -- Guides - General (050)
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	*Case Studies; *Developing Nations; *Fisheries; Foreign Countries; *Marine Biology; Postsecondary Education; *Program Descriptions; *Program Effectiveness; Program Implementation; Science Education
IDENTIFIERS	*Peace Corps

ABSTRACT

This guide was developed to aid Peace Corps volunteers interested in programming marine fisheries projects. Although these projects are not new to the Peace Corps, new staff members may not be aware of the history of marine fisheries efforts in their country. Chapter 1 discusses all past marine fisheries projects initiated by the Peace Corps in Africa, Asia and the Pacific, and in Latin America and the Caribbean. Chapter 2 presents case studies of projects in Chile, El Salvador, Philippines, Togo, and Western Samoa, examining the kinds of factors that influence the success of marine fisheries development projects as well as program strengths and weaknesses. Chapter 3 builds on the preceding two chapters by discussing general criteria for success of future Peace Corps marine fisheries programming and outlines the types of projects that can utilize skilled volunteers. A task analysis for village-level fisheries development that lists the skills needed for various aspects of such a program is included. Also included (in appendices) is a list of all past Peace Corps marine fisheries projects by region and country and a bibliography of general references and references by region and country. (JN)

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MARINE FISHERIES
CASE STUDIES

BY

MARILYN S. CHAKROFF

AND

RANDOM DuBOIS

This publication was produced
for Peace Corps by TransCentury
Corporation, Washington, D.C.

Peace Corps
Information Collection and Exchange
Case Studies C 1
March 1981
April 1982
September, 1982

MARINE FISHERIES PROGRAMMING GUIDE
October, 1980

Prepared for the Peace Corps by
TransCentury Corporation
under Contract No. 79-043-1029

Available through
Peace Corps, ICE
806 Connecticut Avenue, N.W.
Washington, D.C. 20526

Marine Fisheries Programming Guide

Introduction

This guide was developed to aid Peace Corps country staff members who are interested in programming marine fisheries projects. Although marine fisheries projects are not new to Peace Corps, today's Peace Corps staff members may not be aware of the history of marine fisheries efforts in their country. For this reason, Chapter 1 outlines all past marine fisheries projects initiated by Peace Corps, based upon information available in Peace Corps/Washington files and communication from country staff members. Although more written information may be available, Chapter 1 does provide the staff member with enough information to locate and interview host country government officials who may remember the specific project and its results. With this kind of information, staff members will be able to plan future marine fisheries projects that avoid the mistakes made in the past.

Chapter 2 looks at specific case studies of five countries, giving a more in-depth review of the problems and successes of past marine fisheries projects. Much of the information obtained for these case studies is the result of personal communication with RPCVs who served in those projects, and thus these studies reflect their perceptions and views.

Chapter 3 builds on the preceeding chapters by outlining general criteria for success of future Peace Corps marine fisheries programming, and outlines the types of projects that can utilize skill-trained volunteers. It includes a task

analysis for village-level fisheries development that lists the skills needed for various aspects of such a program.

It is hoped that the information in this guide can be coupled with technical programming and training assistance and support to develop relevant Peace Corps marine fisheries projects for the future.

About the Authors

Marilyn S. Chakroff, the senior author, has been working in and writing about fisheries for eight years. She is the author of Freshwater Fish Pond Culture and Management as well as various technical reports, evaluations, pamphlets, and brochures, and wrote the script for the film, Techniques in Induced Spawning. Ms. Chakroff works as a free-lance environmental and fisheries consultant, and her clients have included the Peace Corps, Volunteers in Technical Assistance, the Library of Congress, the U.S. Fish and Wildlife Service, the Agency for International Development, and the Food and Agriculture Organization of the United Nations. As a Peace Corps volunteer in the Philippines, Ms. Chakroff worked as a fisheries biologist and researcher. She holds a Bachelor of Science degree in Biology, and a Master of Science degree in Environmental Communications.

Random DuBois has worked in marine science for nine years. He conducted research on topics varying from assessing the environmental impacts of oil exploration in Alaskan waters to the feasibility of offshore sandmining in the Virgin Islands. As a Peace Corps volunteer in Chile, Mr. Dubois investigated the Chilean abalone and worked with Peace Corps staff to redefine the country's fisheries programs. Mr. Dubois presently works for the Island Resources Foundation, U.S. Virgin Islands. He holds a Bachelor of Arts degree in Biology, and Master of Science degrees in Oceanography and Marine Affairs.

Acknowledgments

As with any report of this nature, many people have contributed to the final document. Thanks are due especially to the returned Peace Corps volunteers who were contacted for information, and to the staffs of the ACTION library, the Office of Programming and Training Coordination, ICE, and Country Desk Units at Peace Corps Washington.

In addition, we are especially grateful to Val Mezainis, Peace Corps Fisheries Program Specialist, without whose support and continuing interest the project would not have been conceived or completed. We are grateful also to Paul Chakroff, Chief of TransCentury's Natural Resources Division, for his guidance and coordination throughout the writing and research of this document. Among the other people who contributed to this report thanks are given to Pamela Ball, TransCentury Program Associate, and David Carey, returned PCV, for their patience and long hours spent telephoning volunteers and to Esther Perry and Rose Burgess for the care they have taken in the lay-out and typing of this manuscript. Finally, thanks are due to all the reviewers at Peace Corps and TransCentury who freely gave of their time to make this a more useful document.

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1. Past Peace Corps Activity in Marine Fisheries

The Peace Corps has been involved in marine fisheries development since 1962, beginning with its first fisheries program in Togo. During the 18 years since, Peace Corps has worked in over 45 marine fisheries projects in 29 countries. Some of these projects have been successful, while others were considered failures. All of these projects reflected the prevailing Peace Corps philosophy at the time, with early projects focused on teaching new fishing techniques and demonstrating new types of fishing gear to small coastal fisherman, while later projects involved highly-skilled volunteers conducting research and teaching at universities. With Peace Corps' current focus on basic human needs, fisheries development continues as an area where volunteers can make significant contributions.

Although Peace Corps has a long history of marine fisheries activity, there has not been one single source of information about such Peace Corps projects. To remedy this situation, Peace Corps has undertaken an inventory and analysis of all past Peace Corps efforts in marine fisheries. This inventory lists marine fisheries activities in Peace Corps countries around the world, giving a short description when such information was available. By identifying past successes and failures in marine fisheries, it is hoped that the inventory will benefit future Peace Corps planning and programing in the marine fisheries field.

The following inventory lists marine fisheries projects and programs by country and by region. Appendix B lists the projects in tabular form, while information used to compile the inventory is listed in the bibliography.

Africa

Kenya

Peace Corps first entered Kenya in 1965 with a program emphasizing secondary education. Though PC/Kenya provided assistance in marine fisheries, participation was largely through individual placements usually in a teaching capacity such as museum assignments and a lectureship at the University of Nairobi. In the period 1972 to 1977, there were four Peace Corps Volunteers (PCVs) teaching and conducting research in various aspects of marine biology and mariculture through the Smithsonian/ Peace Corps Environmental Program. Research species were the native prawn and spiny lobster. These projects lasted through 1978 and were considered a limited success. At present emphasis in fisheries is directed towards freshwater fish culture extension programs.

Mauritius

During the period 1972 to 1976, PC/Mauritius participated in two projects related to marine fisheries. Through the Department of Fisheries three to five volunteers conducted research in the basic biology of the native oyster and shrimp and manipulation of environmental parameters to enhance their respective growth rates. Recruitment of these volunteers was aided by the Smithsonian Institute. A second project, designated the Rodrigues Project, provided volunteer assistance to the fishermen's cooperatives. Activities included the construction of salting and drying stations. The PC/Mauritius program was terminated at the request of the government of Mauritius in 1976.

Morocco

Between the years 1966 and 1973 PC/Morocco placed 255 volunteers in agricultural and fisheries projects though marine fisheries participation was minor. From 1971 to 1973 two PCV's recruited by the Smithsonian Institution were placed with the Ministry of Agriculture. Their activities were concentrated in the area of basic research on marine fish and shellfish. At the end of FY 1977 a few volunteers continued to be involved in marine biology research though this participation was described a waste of talent due to the overqualifications of the volunteers.

Senegal

PC/Senegal participated in a pilot fishing cooperative during the years 1968 to 1971. Though the project was considered a mild success, the reasons for its success were not documented and the project was not continued.

Sierra Leone

PC/Sierra Leone's involvement in marine fisheries has been minor and less than successful. In 1964 five volunteers arrived to work on Sherbo Island off the mainland. Their objective was to work with outboard motor maintenance and repair. The effort was considered a failure as they discovered that, with the exception of 12 fishermen, all the islanders were rice farmers. The project was ill-conceived and the PCVs either terminated or transferred to new positions. There is some evidence that PC/Sierra Leone again became involved in the sector with the placement of two to three volunteers with the Division of Fisheries during the years 1972-73. The placements requested were a boat builder and a marine engineer. As in other African countries, by 1977 PC/Sierra Leone began to move into the area of pond fisheries.

Togo

Togo was the first country in which Peace Corps attempted to initiate a marine fisheries development program. In the first PC group of volunteers to arrive in Togo in 1962, eight of the 47 were designated for a marine fisheries project and had previous commercial fishing experience. The general objective of their placement was to work with coastal fishermen to improve existing and introduce new fishing techniques and technology. By 1963 only three volunteers remained in the marine fisheries area. This attrition was largely attributed to poor programming and lack of job definition. A similar fate was suffered by the second generation of PCV's, attributed this time to "washouts" and conflicts with the local FAO fisheries expert. As a result of these experiences, PC/Togo began to concentrate its effort in freshwater fisheries in 1966.

Asia and the Pacific

Fiji

Between the years 1970-73 Fiji placed 15 volunteers in agriculture and fishery projects. In 1970 four PCVs worked to establish small fishery units before a phase out in 1971. Other areas of involvement were diesel engine maintenance and repair, and fish preparation, storage and marketing strategies. During these years the Smithsonian Institution recruited actively for volunteers in the research area, principally for increasing production of lagoons and estuaries and development of the skipjack tuna resource. These efforts were maintained through FY 1975 before what appeared to be a gradual phasing out occurred. At present there are one or two PCVs working primarily in the area of outboard motor maintenance and repair and boat construction. Though undocumented, it may be that lack of

adequate in-country support structures prevented optimal results.

Iran

Peace Corps was invited to Iran in 1962. Projects at that time were in agriculture, education and health. A change in focus first occurred in 1968 upon the recognition by the Iranian government of pollution and living resource depletion in the Caspian Sea. Between 1968 and 1973, 10 volunteers were involved in a project designed to develop and introduce new research methodologies, improve research capabilities and develop and implement management programs for commercial fishing. This program was later broadened in scope and maintained an average of five to eight volunteers working in the Ministry of Agriculture and Department of Environmental Conservation. The PC/Iran program was terminated in 1976. The Smithsonian Institution recruited for several of the Peace Corps positions in Iran.

Malaysia

Volunteers have assisted in fisheries in Malaysia since 1963. Between 1963 and 1973 eight volunteers worked in fisheries research and development though it is not clear if this was solely oriented towards marine fisheries. The most significant accomplishment during this period was a two-volume cost/earnings survey of Malaysian trawl fisheries by five PCVs serving from 1968 - 1970. This survey was utilized for policy planning by the Malaysian government. It appears an attempt was made for PC/Malaysia involvement with generalist volunteers to participate in the organization of multipurpose fisheries cooperatives. As this effort was in a subsector of agriculture and community development, no specific numbers were obtained. In 1972 Malaysia requested PCVs to assist in the development and expansion of offshore fisheries. PC declined to fill the requests due to the urgent need for other programs and jobs. In 1976 a fisherman as an individual

placement served as an instructor aboard a trawler for practical training of students. At present there are two functioning projects. The Sabah fisheries development project placed five PCVs in FY 1977 to assist the Fisheries Department of Sabah in areas of fish culture, lobster fishing and oyster and seaweed culture. Three more volunteers were budgeted for FY 1979. The second project indicates that PC/Malaysia is moving away from marine fisheries to fish culture. With only one volunteer currently working in the program, nine were projected to be working in FY 1979. Currently, PC/Malaysia is surveying the potential for involvement in marine fisheries in Malaysia.

Micronesia

Peace Corps involvement in the Trust Territories resulted in varying degrees of success and failure in regards to marine fisheries development. Between 1966 and 1972, 53 PCVs served in a fish marketing project. This project was joined by a second in 1967 concerned with research on commercial fish species. That program involved 23 PCVs between the year of initiation and 1973. A third program focusing on fishery cooperative assistance was initiated in 1968. This program divided 15 PCVs among the Islands of Truk, Ponape and Palau. Despite these efforts, an evaluation in 1973 described the fisheries program as one of the worst in the Trust Territories largely as a result of lack of support structures to properly utilize the PCV skills. Since that time the trend has been for PC/Micronesia to confine itself to special placements in pilot programs. At present PC/Micronesia is operating with at least three PCVs in the marine fisheries sector.

Philippines

Though the agreement between PC/Philippines and the Department of Agriculture and Natural Resources took place in 1971 it was not until 1973 that host agencies requested

volunteers to work in the field of marine fisheries. As all PC/ Philippines fishery programs grew and diversified, activities in the marine sector expanded to include research, mariculture and fisheries extension. In 1975 - 1976 there were 25 PCVs working in fisheries of which six were in fisheries research and seven in fisheries regional planning. As a result of the Philippines Expanded Production Program additional PCVs were requested in FY 1976. In regards to research, the increased number of PCVs were recruited to work with the Bureau of Fisheries and Aquatic Resources (BFAR), as well as other government and university entities. Highly skilled PCVs were requested including oceanographers and planktologists. Fisheries planners also were requested to work with the Plan and Program Unit of BFAR to be placed throughout the geographical regions of the country. In addition to these, in FY 1972 recruitment in the marine fisheries area expanded to industrial and municipal fisheries (engineers) as well as oceanographers and marine biologists. In 1978 PC/Philippines initiated its first in-country technical training program involving 39 trainees designated to work in fisheries development. Marine research continues to be a component of the fisheries development project though it remains small compared to the freshwater fishery component. The Smithsonian has been involved in at least seven PCV placements in various aspects of marine fisheries. The marine fisheries projects in the Philippines have been judged to be effective largely due to excellent host country support.

Solomon Islands

Since 1977, there have been several small programs in the marine fisheries field in the Solomon Islands. Four volunteers are working in programs to expand local marine products gathering and consumption and to organize fish sales locally for cash income. Volunteers and their counterparts have organized groups of fishermen to provide a

continuing supply of fish to a subdistrict center, and have developed a system to deliver ice to villages, store fish, pick up and transport fish to the center and sell them locally from a fish market. In one other program, a volunteer and his counterpart have been working at the country's only turtle sanctuary in tagging and culturing turtles and developing a system for educating local people in conservation and wise use of turtle stocks. Two additional volunteers recruited by the Smithsonian Institution have been working on a UNDP bait fish development scheme to support large scale production of bait fish for the tuna fleets. More volunteers are expected in marine fisheries projects in 1980.

Tonga

The first PC/Tonga involvement in marine fisheries ended in 1972 after 10 months when the volunteers were evacuated because of medical problems. Nevertheless the turtle project with which they were involved was considered a success. From 1972 through 1975 there was only one PCV working in marine fisheries. In FY 1974 there were two PCV's participating in fisheries development/cooperatives. The Smithsonian also participated in recruitment efforts for PC/Tonga placing two PCVs in oyster mariculture and marine extension activities. At present there are two volunteers involved in expanding the fisheries development/cooperatives with the assistance of a grant through the Foundation for the Peoples of the South Pacific. A third volunteer has successfully launched a Marine Parks Reserve Program and is training two rangers. The fourth volunteer is involved in fisheries research, identifying locally caught fish, assessing the economics of bottom fishing, and developing an industry to smoke popular fish to increase their market potential.

Western Samoa

PC/Western Samoa first entered into marine fisheries development in 1970. Four projects were identified for recruitment: fisheries association development, turtle research, skipjack tuna development and prototype ferro-concrete boat building. Levels of PCV input were projected to increase from four in 1971 to ten by 1974. Though it is not clear what evolved in each individual project, PC involvement continued with enough success to introduce a new village level fisheries program in FY 1975. PCVs trained in marine mechanics worked with local fishermen in the repair and maintenance of outboard engines. These programs continued through FY 1977 with apparent success though since that time it appears efforts have been directed more toward freshwater fisheries.

Latin America and the Caribbean

Belize

Peace Corps involvement in fisheries was never major in Belize, usually occurring as a component of other programs such as food supply or rural development. With the exception of the involvement of two volunteers in 1962/63 with a previously established lobster cooperative, no other direct Peace Corps involvement in fisheries occurred during the 1960's. A second period of activity occurred in the early 1970's with individual placements in the agricultural omnibus program as it related to fishing cooperatives. In addition, PCVs have worked in research designed to increase exports of conch and other living marine resources. This research included studies in the field biology and dynamics of reef fish. This area was recruited for by the Smithsonian

Institution. Two explanations have been offered for lack of PC/Belize participation in marine fisheries. One suggests that the presence of other international organizations working in the sector precluded significant PC contributions. The second maintains that the Belize government has never placed a high priority on requesting volunteer support in fisheries. At present, there are indications PC/Belize is focusing more on freshwater fisheries development.

Brazil

Though PC has been in Brazil since 1962 it did not become involved with the Supervision of Fisheries Development (SUDEPE) until 1966. This Brazilian agency was created to stimulate the development of the fishing industry and provide assistance to small fishermen. PC first became active in the sector with five volunteer pilot projects designed to assist the small fishermen through development of fishing colonies followed by cooperatives. Activities included medical help, outboard motor maintenance repair and boat building. This pilot group was followed by a group of 32 volunteers who were to work in the states of Guanabara and Rio. At the end of 1968 there were 27 volunteers working at 14 sites. The project continued to grow with 32 active PCV's placed in the states of Rio, Espirto Santo, and Minas Gerias. Seventeen others were projected to work in Pirapona and Minas Gerias in 1970. The fisheries cooperative project was joined by the Santa Catarina fisheries project in 1972. In that project PCV's were engaged to conduct research in shrimp culture, train counterparts and participate in fishery extension activities. In addition to these activities, individual placements were recruited for research in the area of marine pollution at the Federal University of Rio Grande do Norte. From the mid-1970's Peace Corps activity appeared to go into decline as the 1976-77 country Management Plan no longer cited recruitment figures for the marine fishery sector.

Central American Fisheries Program

In response to widespread malnutrition, unemployment, and under- and irrational exploitation of living marine resources, the Central American Economic Council (CEC), composed of Panama, Honduras, El Salvador, Guatemala, Costa Rica, and Nicaragua, requested help from the Food and Agriculture Organization (FAO) of the United Nations. In 1966, the CEC created a Department of Fisheries (CCDP) composed of national fisheries department representatives from each country to act as the counterpart to FAO. The goal of this union was to improve methods of production, harvesting, processing and marketing, solve nutrition problems, and promote growth of commercial fishing industries. Recognition by FAO and the countries involved of Peace Corps' previous experience in Central America resulted in a formal request for Peace Corps participation. Separate requests were made by each national fishery agency for groups of PCV's to work in some aspect of the host country's fishery sector. The project began operating in 1965 and was designed to terminate in mid-1971 when the CCDP would replace FAO. PC involvement ran from 1968 through the scheduled termination date. Two cycles of PCVs arrived in their respective countries during that time period. Whereas the PC staff and the first group of PCV's had little knowledge of what to expect, the second group was more selectively placed in sites with greater potential. The initial regional effort amounted to approximately 45 volunteers in six countries in all aspects of the fishing sector. There has been a great deal of documentation of the overall project and the concept of developing fisheries on a regional basis. The program was not considered a success and degenerated to a series of six separate projects. This has been attributed in varying degrees to: poor PC programming; failure to define FAO, PC, and host country roles; ineffective training; inadequate in-country staff and

inadequate support by host country agencies. Peace Corps continued its involvement in marine fisheries development after FAO's withdrawal only when so requested by the host country. Individual PC projects under the Central American Fisheries Program in Panama, Honduras, El Salvador, Guatemala, Costa Rica, and Nicaragua are discussed under those country h adings.

Chile

Chile was one of the first countries where marine fishery development was recognized as a priority and actively pursued by Peace Corps. PC/Chile involvement was initiated by two volunteers placed between 1961 and 1966 with INACAP, a technical training institute. After this period the program grew and in 1968 an agreement was reached between the Ministry of Agriculture and PC/Chile to recruit 10 marine biologists to work with the agency in basic research and expansion of the fishery industry. The marine fishery development project continued to expand and by 1973 between 75 and 100 volunteers had served in the program. Despite the large numbers and longevity of the program, it has been defined as a limited success because of a failure to reach the poor due to such factors as lack of technical expertise, lack of in-country support, weak economic conditions, lack of staff expertise, and improper or lack of preparation before PCV arrival. All PC/Chile programs were cut radically or terminated during 1972-74. By 1974, individual placement volunteers with special skills, often recruited through the Smithsonian/Peace Corps program, again were being utilized by PC/Chile. By 1978 placement came full cycle as the placement of highly skilled individuals was supplanted by a greater effort to work in fishery extension. At present PC/Chile involvement in marine fisheries is being phased out due to several reasons including: volunteer frustrations expressed in recommendations not to be replaced, a long and mixed

record in marine fisheries, and the recognition of other areas of documented success which more easily justifies PC/Chile participation.

Colombia

The PC/Colombia program was so large and wide ranging one must assume it came in contact with marine fisheries at one time or another. Unfortunately, the only documentation encountered that supports this assumption outlines minor efforts with fishing communities in the large cooperative project in Colombia. These efforts were made in the mid-1960s to assist cooperatives along the Pacific Coast in the Departments of Choco and Valle. The only other documentation of PC/Colombia participation in the sector indicates that a few volunteers worked in salt water fish research in 1973 and another volunteer was involved in ornamental fish research on the north coast.

Costa Rica

Preceding the Central American Fisheries Program there appears to have been no involvement in marine fisheries by PC/Costa Rica. In 1969 PC/Costa Rica participated in a cooperative program with the objective of providing business expertise to a wide diversity of sectors including fishing cooperatives. In response to a request from Costa Rica six volunteers were placed as a result of the regional fisheries project. Two volunteers worked with the university while the rest worked in the field. Due to many of the problems cited common to the regional project as a whole, the program was not a success and was not continued. By the early 1970's emphasis was placed on freshwater fish culture and this continues to the present.

Dominican Republic

PC/Dominican Republic's first experience with marine fisheries was less than successful. In a program initiated in 1964, 11 trainees were

recruited as fishermen to work with the local fishing communities. Of the 11, four left during training, two terminated prior to completion of service, and two transferred into freshwater fisheries projects. The various reasons offered for the project's demise were poor planning, careless selection, weak training and failure to involve the community. One favorable aspect of the project was the introduction of small outboard motors in the fishing community of Sanchez. After this initial effort in the sector, there appeared to be no other activity until the early 1970's when a small program in conjunction with IDECOOP was considered. In 1975, three PCVs were placed to organize a model pilot fishing cooperative to assist fishermen in processing, preserving and marketing their products. This program appears to be continuing to the present with five volunteers involved in coops.

Eastern Caribbean

The only documentation of placement in marine fisheries was a boat builder recruited for Antigua in 1976.

Ecuador

The only reported involvement of PC/Ecuador in marine fisheries was the placement of one volunteer with the national fisheries agency in 1974. At that time it was suggested Peace Corps could provide technical assistance in commercial fishing techniques. There is no evidence that this suggestion was acted on at any level of significance.

El Salvador

Though PC has been involved in El Salvador since 1962 it was not until seven volunteers arrived to work with the Ministry of Economy in connection with the regional fisheries project that PC/El Salvador became involved in marine fisheries. The primary tasks of three PCVs were to work with a newly-formed fish cooperative and demonstrate new fishing gear. This was con-

sidered a pilot fish coop and the most successful effort in the regional project. Two other PCVs were assigned to a second cooperative effort, judged less successful due to lack of support. The remaining two were assigned directly to the FAO project (see p. 13). PC/El Salvador's effort in cooperatives has continued through several generations up to 1976 even as a large freshwater fisheries program was being initiated. At present, however, PC/El Salvador is phasing out its involvement in marine fisheries in favor of developing fresh and brackish water fish pond projects. It must be noted that the Smithsonian Institution was active in recruiting for PC/El Salvador, placing volunteers in both the cooperatives program and in research projects on shrimp and oyster culture.

Guatemala

Previous to the Central American Fisheries Program, PC involvement in Guatemala had been nominal with a total of five volunteers working in fishery extension for improvement of fishing techniques and equipment. Ten PCVs were trained for Guatemala as part of the regional program, the majority being generalists and biologists. The program was described as somewhat backward in comparison to the other Central American countries with the major activities of the PCVs confined to boat building. This was attributed to lack of guidance by both PC staff and the host agency. This effort was not renewed. Between 1969 and 1973 two new projects were launched in the sector of agriculture coops (EACA, FENOAR) though it is doubtful if there was any impact on fisheries cooperatives. A freshwater fishery project was initiated in 1973 and has remained viable to the present.

Honduras

Though PC/Honduras may have been involved in marine fisheries prior to the Central American Fisheries Program, it was involved only indirectly through the large agriculture

cooperative/coop sharing programs. Honduras' response to the regional fisheries program was to request 10 volunteers to participate in a coop/fisheries development project situated at five sites. The requests were filled and volunteers placed and the project generally was considered a successful one. This was attributed to the placement of qualified volunteers, strong staff capabilities and a supportive host country agency. One project that continued from this initial effort was the north coast fishing project with five PCVs working in it from 1970 to 1973. The overall objectives were to improve fishing techniques and raise food production. Programs of this type continued with the Department of Renewable Resources in Honduras through the 1970's but appear to have been replaced by freshwater fishery projects in 1978-1979.

Jamaica

PC/Jamaica's only involvement in marine fisheries took place in the middle to late 1960's. The primary purpose of placement of the five to six volunteers in the cooperatives program was to introduce the use of fiberglass boats and motors designed to replace the traditional cottonwood canoes. This, it was hoped, would allow the fishermen to fish beyond the coral reefs. This project continued into 1968 with the participation of seven volunteers. There were no further evaluations to determine the fate of the project though PC/Jamaica activity in cooperatives was documented into the early 1970s. At present PC/Jamaica activity appears to be focused on inland fish pond culture.

Nicaragua

Marine fisheries has never been a priority in Nicaragua with PC effort directed to the artisinal fisherman of Lake Nicaragua. The six volunteers trained for the Central American Fisheries Program arrived to find the in-country fisheries division abolished. They were reassigned to INFONAC (Department

of Fisheries) but found it more oriented to the lake research project. There appears to be no future for PC involvement in marine fisheries in Nicaragua.

Panama

Peace Corps was involved in fishing cooperatives in Panama as early as 1966. The level of involvement averaged three to five volunteers until the start of the Central American Fisheries Program. Ten PCVs were assigned to Panama including five generalists, a fishing technician, a biologist, a market analyst, and a food processor. The program was considered the most successful in the six countries. This success was attributed to clear objectives, adequate support, qualified volunteers, and a reasonably developed fishing industry. Two major projects consisted of working in the Chorrillo fishing cooperatives and working in general artisan fishing development at five sites in Panama. The programs were cancelled with the termination of Peace Corps/Panama in the early 1970s.

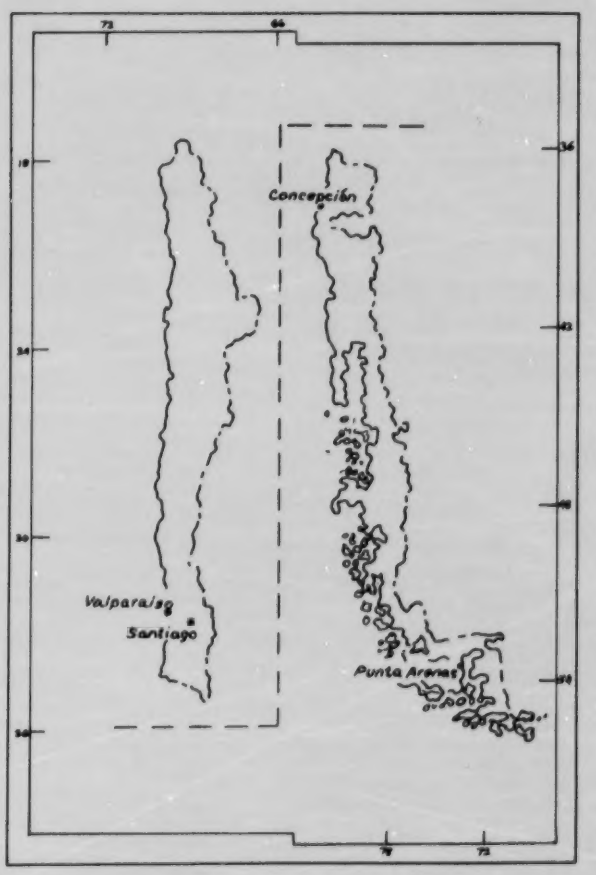
Peru

Though Peace Corps first entered Peru in 1962 it was not until 1965 that PC/Peru embarked on a program of cooperative assistance. Between 1965 and 1973 140 volunteers worked in the cooperatives project. The emphasis was on general rural and urban cooperative development and documentation of specific fishery cooperative efforts was found. Negotiations were in progress with the Ministry of Fisheries for PC/Peru participation in marine fisheries when all PC activities were terminated by the Ministry of Foreign Relations. Direct PC/Peru activity in fisheries prior to termination appeared to be limited to a few freshwater hatchery projects.

2. The Case Studies

Marine fisheries projects require several kinds of support to be successful. When such support is available, projects have a greater chance of success. When such support is not available, projects may not succeed as well or may fail to meet the objectives set for the project. In order to determine whether and how to continue to work in marine fisheries development, the Peace Corps chose five countries from the inventory in Chapter I for case study. The five case studies detailed here were chosen to illustrate the kinds of factors that influence the success of marine fisheries development projects. The projects within each country were evaluated to discover their strengths and weaknesses in the hope that future programs and plans will benefit from the evaluation.

Chile Case Study



Source: Weil, Thomas E. et.al. 1969. Area Handbook for Chile. Foreign Area Studies, The American University, Washington, D.C.

Chile is a long, thin country that stretches 2,650 miles from its northern borders with Bolivia and Peru to the southern tip of South America along the Pacific Ocean. Only 110 miles wide on the average, Chile encompasses landscapes and climates that vary from desert where no rainfall has ever been recorded, to tundra inhabited only by penguins. Santiago, the capital city founded by the Spanish in 1541, is located in Chile's central valley. A Spanish colony for three centuries, Chile fought for her independence along with her neighbors, and by 1823 was a free, united country.

Chile is one of the most sophisticated countries in South America, with a literacy rate of over 90% and a labor force that contains large numbers of highly-trained professionals. Mining of copper, iron, and nitrates accounts for more than 80% of Chile's export earnings, while agriculture accounts for only

10%. Traditionally, agriculture in Chile consisted of a small number of very large farms. Eighty percent of the viable land was taken up by only 7% of the country's farms. Since 1972, land reform has been breaking up large farms into smaller parcels worked by farm families. However, due to a lack of investment and inadequate mechanization, these small farms do not produce as much as the larger farms did previously. As a result, Chile imports much of its food.

Although very developed in some ways, today Chile still has 2 to 3 million people who live in extreme poverty. Services for the poor recently have been reduced or eliminated in an effort to decrease inflation, and as result, malnutrition, unemployment and poverty-related diseases are on the rise. Recognizing these problems, Chile began requesting Peace Corps volunteers to work in agriculture programs in 1962. Volunteers first began working with fishermen in 1964.

Fisheries in Chile: An Overview

Chile had a very highly developed commercial fishing industry, and fishing for such species as tuna, mackerel, flounder, swordfish, bluefish, and king crab was important to the economy in the 1960's. One of Chile's major exports was the anchovy, or anchoveta, which was ground up and sold as fish meal and used in animal feed. High anchovy yields were attributed to the presence of cold, nutrient-rich waters along the shore. These productive waters, a result of coastal upwelling, were driven by prevailing southerly winds along the Chilean and Peruvian coastline. The anchovy catch in Chile, however, was unpredictable due to a phenomenon called "El Nino." This phenomenon was created by a change in wind direction to a northerly wind which

resulted in displacement of the colder waters by warmer, nutrient-poor water. Anchovy populations were reduced either by migration to the preferred colder waters or by direct kill. Chile's commercial species were subject to unpredictable changes such as El Nino, and as a result, fishermen would overfish traditional grounds when fish were available.

Most of Chile's fishing, however, was still done by small fishermen working just off the coast in small boats up to 30 feet in length. The fishermen were encouraged to belong to the fishing cooperatives, and in 1966 Chile had 38 legally-operating cooperatives along the coast. Each cooperative had from 10 to 30 boats, called faluchos, equipped with either marine diesel motors or sails. Fishermen who were members of cooperatives handed over their catch to the cooperative, which sold the fish in the public market or directly to a client at the dock. The cooperative thus effectively eliminated the middleman, and ensured a better profit to the fishermen. Most fishermen also needed help in fishing techniques and methods, and the cooperatives needed assistance in accounting and other basic management skills. Commercial fishermen needed more information on the biology of important fish species and other marine resources. Two volunteers worked with fishing cooperatives from 1964 to 1966, and as a result of their successes, Chile requested its first group of marine fisheries volunteers from the Peace Corps in 1966.

Peace Corps Involvement with Chilean Fisheries

The first group of marine fisheries volunteers for Chile was recruited by Peace Corps late in 1966. This group of 19 volunteers was trained at the University of New Mexico and at Humboldt State College in California, where they received intensive training in fisheries and in the operation of Chilean fishing cooperatives. The volunteers had

little background or experience in fishing, although several had degrees in accounting or business. The volunteers were requested by the Instituto de Desarrollo Agropecuario (INDAP), the country's agricultural development agency, although they were to be assigned to individual cooperatives and were responsible to the cooperatives rather than to INDAP.

The Peace Corps contracted with Humboldt State College to provide technical services to these volunteers once they were in the field. This included providing a technical consultant stationed in Chile. This consultant was a returned Peace Corps volunteer who had experience in rural areas and could communicate easily with Chilean government officials. He worked as a technical Peace Corps staff person for the entire two-year period that this group was in-country.

Prior to each volunteer's arrival at their sites, INDAP sent a letter to each cooperative explaining who the volunteer was, what he was expected to do, and what the Peace Corps objectives were. The Peace Corps also informed cooperatives of the volunteers' arrival through site visits by the Humboldt State representative. Although nearly every cooperative was expecting a volunteer, their reception varied greatly. Some volunteers were met by their cooperative leaders, introduced to all coop members, and given a place to stay, while others had to go find the coop representative by themselves. In general, volunteers were well-received and cooperative members looked forward to working with them.

Each volunteer was given a letter of introduction from INDAP's Central Office in Santiago to their field representatives in the area of each cooperative. There was some confusion among the volunteers as to which division of INDAP they were supposed to work with. The original Peace Corps agreement had been with INDAP's Subdivision de Asistencia Cooperativa, which provided coopera-

tive assistance to both agricultural and fishing cooperatives. Another section, the División de Asistencia Tecnica y Crediticia, provided financial and technical aid to cooperative members. The Subdivision only had two full-time and two part-time field representatives, while the Division had between eight and twelve field representatives with whom volunteers had more contact. Both sections felt they should be the only ones working with volunteers. However, since the Subdivision had requested the volunteers, they were responsible to that agency.

Another problem that surfaced resulted from the fact that INDAP only recently had been given responsibility for fishing cooperatives. As a result, no formal plan existed for the development of fishing cooperatives or for utilization of the volunteers. Other agencies in Chile were working with fishing communities as well, such as the Instituto de Fomento Pesquero (IFOP), the Institute for Fisheries Development. Volunteers often worked with several fisheries agencies and found themselves torn between them.

In each of their cooperatives, volunteers gained acceptance at first simply by going fishing with cooperative members. Most volunteers were able to gain the confidence of coop members and found it easy to move into discussions about the coop, participate in coop meetings, and make suggestions to solve some of their problems. Volunteers were able to establish new cooperative business filing systems, teach new fishing skills, train cooperative members in accounting and basic management skills, and create a greater sense of unity among members. Volunteers developed a simple manual on accounting, slide shows and other educational aids for fishermen.

Most volunteers felt that their success depended greatly upon their ability to communicate in Spanish. Those who were fluent had less difficulty working with cooperatives than

those who had trouble speaking. During the two-year tour, four volunteers left the country, and three changed their job sites. Volunteers with technical backgrounds felt that people with community development training were needed to work on fishing communities as a whole, while volunteers with community development training believed more technical volunteers were needed. However, for the most part all of these volunteers were considered to be successful, and INDAP anticipated using more volunteers in fishing cooperatives. There is some evidence that over 60 volunteers participated in INDAP's cooperative program during a seven-year period, but little information is available to describe the program or its results.

The Second Group of Volunteers

A second group of marine fisheries volunteers was requested in 1968 by the Institute for Fisheries Development (IFOP) to act as samplers gathering data in seaports on the catch of commercial and artisanal fishermen. Peace Corps recruited 16 volunteers for IFOP in 1969. This group of volunteers was trained at the University of Washington in fish marketing, fish processing, statistical techniques used in Chile, classification of Chilean fishes, use of fish gear in commercial fisheries, fish management, and the microbiology of fish spoilage. When this program was planned, Peace Corps didn't know if marine biologists with the necessary skills would be available, so their job descriptions were very vague. At the end of recruiting, however, it was clear that the volunteers were highly skilled, so the job descriptions were rewritten for more technical positions within IFOP. These volunteers were switched from mere data-gathering to active research. However, this switch did not occur until two months of training already had taken place - training which was no longer relevant to the jobs the volunteers would have.

When these volunteers arrived in September of 1969, they were assigned to the Natural Resources Division of IFOP. This division consisted of four sections - biology, stock assessment and assistance, shellfish, and distribution and abundance. Within each section, volunteers were treated as employees of IFOP, responsible to the Chilean in charge. Volunteers worked with Chilean scientists on projects such as research on the life history and abundance of commercially important mollusks, crustacea and fish; population dynamics of important commercial fish species; and special research related to the degrees of each volunteer. Volunteers also worked on the development of a computer program to improve the analysis of catch statistics for IFOP.

This project had several problems, however, because it was not well-defined from the beginning. Volunteers often found themselves assigned to projects that did not exist, or which had no funding for equipment. Local supervisors were not consulted about volunteers nor even told of the volunteers' arrival. Four volunteers assigned to IFOP moved to universities where they got support to do research on the use of algae for fertilizer, and the biology and life history of halce, a common Chilean fish. Volunteers also had trouble working with Chilean scientists because of differing attitudes towards research. The volunteers were considered by the Chileans to be cold, unemotional people, an attribute that is not favorable in Chilean eyes, while the volunteers found Chilean scientists to have a different educational focus and a lack of interest in their research. Thus there was animosity between volunteers and their counterparts. This was exacerbated by the fact that many volunteers felt they were taking jobs away from qualified Chilean professionals.

Support from Peace Corps also appeared inadequate. The only Peace Corps staff person with an interest

in fisheries projects, the Humboldt State College representative, left the country one month after this group of volunteers arrived, and there was no one to take his place. Volunteers felt that Peace Corps was responsible for their inappropriate training, their lack of jobs and support from IFOP, and felt that Peace Corps had given them misleading information about the status of research in Chile. In general, these volunteers were dissatisfied, but even so were able to contribute to the scientific development of Chilean fisheries. Apparently IFOP felt volunteers had made valuable contributions because they requested six more volunteers to work in the Technology Division in 1970.

The Third Group of Volunteers

In 1970 IFOP became more interested in the use of fish and fish products to provide the necessary protein in people's diets. They requested volunteers to work in nutrition, food science, microbiology, and chemical engineering. Their objectives were to increase the utilization of products of the fishing industry, promote export of fish products, create new sources of employment, and train Chileans in food science and technology, nutrition, and microbiology of foods. The volunteers were to work as part of teams doing research in IFOP laboratories. These teams were to achieve the IFOP objectives by improving existing fish products, methods and techniques of fish processing; developing new products and increasing quality and variety of food produced in Chile; lowering production costs and initiating quality control; and promoting the fish products industry. It is not clear if these volunteers were recruited and sent to Chile. However, there are detailed job descriptions available that indicate the positions were given much thought. Presumably volunteers with these skills were found and placed in these fields.

Volunteers with Special Skills

Starting with the highly-skilled marine biologists recruited for IFOP in 1969, Chile began requesting volunteers with special skills for assignment in a variety of research and fisheries development programs. By 1974, Peace Corps was providing individual placement volunteers who had technical backgrounds for work in the development of regional seafood marketing cooperatives, fisheries education, and marine ecology research. Most of these volunteers had no technical training since they were recruited for specialized positions, but all received language and some cross-cultural training prior to their placement. For example, one volunteer who arrived in 1974 had a degree in business administration. He was assigned to a cooperative which had been taken over by the Government of Chile because of its poor management. The cooperative was owned by one family, and they were exploiting the cooperative members to make a profit for themselves. The volunteer worked with the coop to improve seafood distribution and general coop administration. After one year, he transferred to a university to teach fishery marketing. His support came from Peace Corps and the university, but he clearly was responsible for most of his own supervision. This volunteer developed fisheries newsletters for cooperatives and the commercial fishing industry, and produced a radio program on Chile's fishery resources. He was considered a successful volunteer although his original job was not well defined and he found his job after the first did not work out.

Another volunteer who arrived during this same period had a degree in marine biology and was requested to serve as a professor at the Catholic University in Valparaiso. This volunteer taught courses in aquaculture and ecological sampling techniques, and did some research. He had a counterpart who left three months after he arrived to do graduate work in France. The only

support he received was from the university, but due to political troubles even that was often curtailed. This volunteer felt that he was replacing a qualified Chilean professional, and recommended that Peace Corps not place any more volunteers at the university.

In 1975, the first Smithsonian/ Peace Corps volunteers arrived in Chile. One volunteer, a marine biologist with six years of experience, went to the University of Chile, where he taught ecology, marine biology, ecological sampling techniques, statistics, and tidal organisms identification and ecology. This volunteer also collected data on a local clam, the taca. During the second year at the university he worked on the taca exclusively, investigating spawning, raising, and culturing of the clam. He was supported in these activities by the Smithsonian coordinator and by the Peace Corps, especially by a Chilean staff member in Santiago who kept interest in fisheries programs alive. He also received some support from the university, and had good, hard-working counterparts.

Another Smithsonian volunteer with a degree in oceanography worked jointly for the the University of the North and Catholic University. For the University of the North the volunteer initiated studies in the development of a locally-produced antifoulant paint. This project was too ambitious an undertaking and was not adequately supported by the university. For the Catholic University the volunteer obtained information for developing a resource management plan for a local shellfish, the loco. This volunteer had a counterpart and received some equipment from the university, as well as support from a private institution, the Chile Foundation. This project was considered a success due to the greater resources available through the Catholic University. However,

at this volunteer's recommendation, no more volunteers were sent to work at the university. Like volunteers before him, he felt that he was replacing qualified Chilean professionals.

In 1976, two more volunteers arrived in Chile, one to work on an oil spill in Punta Arenas, and another to work with a Catholic University in southern Chile. The volunteer who worked on the oil spill received support from the Patagonian Institute and the Shell Oil Company, and published two papers in the Institute's Journal on the oil spill and its effects. Although the Institute requested more volunteers after this volunteer completed his tour of duty, Peace Corps decided not to recruit any more.

The volunteer assigned to the Catholic University in southern Chile had degrees in biology and marine science, and had been in the US Navy. He taught courses in general ecology, and conducted laboratory sessions. He worked with Chileans to design several courses and lab exercises. He also did research on using kelp for agricultural purposes, the ecology of kelp beds, and a review of artisan fishing methods, equipment, and species of fish caught. This volunteer did not receive much support from the University or Peace Corps; however, he felt that he was successful in teaching and that he left behind several good courses for future Chilean students.

Four more Smithsonian volunteers were recruited for Chile in 1977. These volunteers were supposed to work in fisheries extension with cooperatives in small coastal villages, but each ended up doing research and education of cooperative members. One volunteer was supposed to help a cooperative improve their fishing techniques, but he discovered that they were already overfishing the area, and

needed more capital investment in the coop instead. Later on he worked for a university and wrote a booklet on the fish species in the area, including the common local name, scientific name, English equivalent, and classification. The booklet was written for the use of coops and industry, and was published by the university. This volunteer and the others in the group felt that they were taking jobs away from qualified professionals, and that Peace Corps expected them to work as community developers rather than, or in addition to, their primary jobs as fisheries biologists. Few had the training or interest to do so as they considered themselves scientists first and extensionists second. However, by 1979 the Peace Corps began to focus its activities on meeting basic human needs, and Chile again requested volunteers to work in fishing villages.

Peace Corps' New Fisheries Program

In response to a request from Chile's new fishery agency, the Servicio Nacional de Pesca (SNP), the Peace Corps recruited 17 volunteers to work in poor fishing villages, called caletas. These volunteers were trained in community development theory and practice as well as fishing gear, methods, and business skills. Both the Peace Corps and the SNP hope that this program will eliminate some of the problems that volunteers and Chileans had with previous Peace Corps activities. For example, one common complaint was that volunteers felt they were just replacing qualified professionals. Very few Chileans with higher education are willing to live and work in caletas, which are among the poorest sectors of Chile; thus volunteers are providing technical help where no other help would be available. Another problem that highly-skilled volunteers had in earlier programs was the lack of support for their research studies.

Peace Corps is trying to eliminate this problem by recruiting volunteers who are more interested in personal development than professional advancement. All of these factors are being considered by Peace Corps in determining the future of fisheries activities in Chile.

Evaluation of the Project

The Peace Corps marine fisheries projects in Chile have been evaluated formally three times, in 1968, 1970, and 1979. Each evaluation has had a different attitude towards the type of work in which Peace Corps was involved, primarily because during those years the philosophy of Peace Corps changed greatly. In the 1968 evaluation, individual volunteers were evaluated for their successes in fishing cooperatives and the general concensus was that volunteers had been successful in helping cooperative members, and teaching new fishing skills. These volunteers were supported both by Peace Corps and by their host country agency, INDAP. However, this evaluation stated that cooperatives in Chile have problems that volunteers cannot help with, and that the future of Peace Corps programs in fishing cooperatives does not look promising.

The 1970 evaluation, on the other hand, dealt with the problems that specialist volunteers had in Chile. The evaluation stated that this program of highly-trained volunteers seemed to be repeating the same mistakes made in other specialist Peace Corps programs. These mistakes included a lack of communication concerning their program with lower levels of host country agency personnel, and the resulting lack of financial and technical support; inappropriate training by Peace Corps and selection of volunteers unable or unwilling to work in unstructured, ambiguous situations; a lack of good advance information about the nature of each volunteer's job that hindered their self-

preparation; a lack of good cross-cultural training to help American scientists understand the attitudes towards research of their Chilean counterparts. The evaluator sums the program up by stating that these volunteers were "... highly specialized scientists and their talent is useless when locked into an unproductive job situation."* The volunteers in this program were recruited to do good, sound, scientific research and they were frustrated by the situations in which they found themselves. Volunteers also felt that Peace Corps should do more investigating of assignments before recruiting volunteers to avoid such situations in the future.

By 1979, Peace Corps had begun to focus on community development rather than scientific research, and the evaluation done that year reflects this. In this evaluation volunteers in fisheries extension and fisheries development were evaluated as to their effectiveness in reaching the poor. The evaluation stated that volunteers placed in caletas were unprepared and unwilling to live and work in caletas full-time, and that they had not received any community development training. It was as a result of this evaluation, based on interviews held early in the year, that a new program began in July that focused on community development programs rather than fisheries development. This 1979 evaluation also stated that several projects undertaken by volunteers had been tried in the 1960's with little success, but that neither volunteers nor staff seemed aware of previous failures. The evaluation concludes with recommendations that Peace Corps should phase out all fisheries volunteers who were not living directly in caletas and that fisheries volunteers should be placed with non-governmental organizations capable

*Berdegue, J. and R. Joy. 1970. Chile Fisheries Program: Overseas Evaluation. Peace Corps Office of Evaluation.

of giving them the necessary support; that volunteers should be trained in community development; and that studies should be done on certain cooperatives which seem to be exploiting both cooperative members and volunteers to see if Peace Corps should continue to be involved. All of these recommendations seem to have been followed in the development of the fisheries extension program that began in July 1979. It appears that Peace Corps will reexamine its involvement in fisheries in Chile when this program is completed and at that time decide whether to continue in this field.

Successes and Failures

Marine fisheries projects in Chile have been influenced by several factors. When these factors were present, the project succeeded; when they were absent or in short supply, projects did not do as well. These factors include the following:

- The support of host country agencies that requested volunteers had a major impact on individual projects. For example, in the cooperatives program with INDAP, cooperatives were informed of the volunteers' arrival and welcomed them. In the program with IFOP, local supervisors were neither consulted on the need for volunteers, nor informed of their arrival. Volunteers working with universities found that support varied, but in all of these projects volunteers questioned the need for highly-skilled specialists. They felt resentment from counterparts when they took a research job that a trained Chilean could do.

- Peace Corps support varied with the projects as well. The cooperatives project had technical and field support from the representative of Humboldt State College, while the IFOP group had no such support. Volunteers placed individually had little support from Peace Corps, primarily, they felt, because Peace Corps had no technical people on the staff who could understand their problems and support needs.

- Volunteers who worked with local fishermen were accepted based upon their technical skills and their ability to communicate in Spanish, and after initial trial periods,

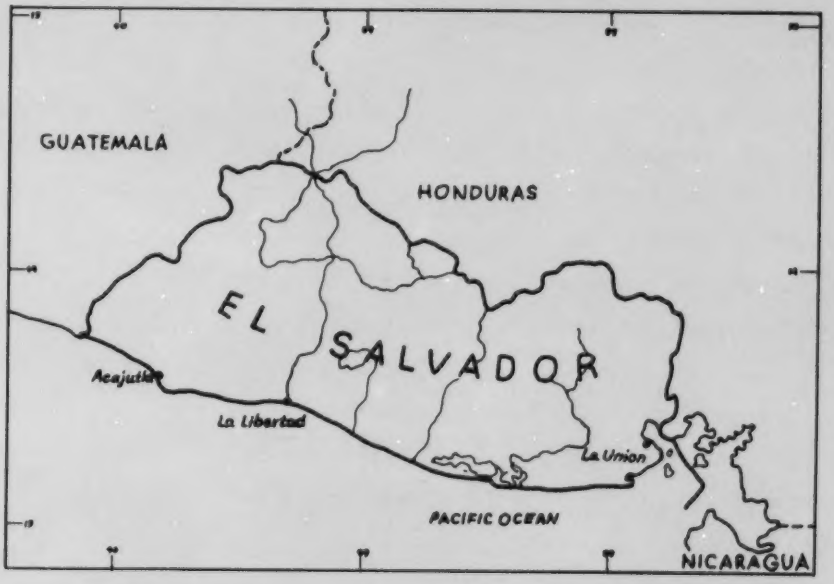
most volunteers felt they were trusted by their cooperative members. Volunteers who worked in more skilled positions were uncomfortable because they felt they were taking jobs away from trained and qualified Chilean professionals. Scientist volunteers were frustrated also by the difference in attitude towards research of the Chilean scientists.

- Volunteers with training in marine fisheries were not given additional training that would enable them to operate more effectively in their communities, while those with community development skills felt that more technically-skilled volunteers were needed. Peace Corps itself changed radically over the years, and much of its original expertise in community development was lost. Even when Peace Corps wanted to work such theories into training, volunteers did not feel it was adequate for their needs.

In all of these projects there is an undercurrent which points out a problem that Peace Corps in Chile has had since the beginning of its involvement in marine fisheries. Chile is a fairly developed country with a large commercial fishing industry, and it places priority on scientific research to improve the commercial catch. Historically there has been little interest in artisanal fishermen in Chile. Peace Corps, however, began its projects in Chile by focusing on small coastal fishermen. As projects progressed, Chile asked for more technically-skilled volunteers and Peace Corps tried to comply. Volunteers recruited for these new technical positions had more problems with support and had different expectations of their Peace Crops experience than less technical volunteers; they were frustrated and recommended that Peace Corps not place volunteers in such positions. As a result, Peace Corps has found itself out of tune with both volunteer and host country demands. Today Peace Corps feels that the best approach is working directly with people in their villages, but such assistance will have to be approved by the government. As a result, the future of Peace Corps' involvement in marine fisheries in Chile is uncertain at best.

El Salvador Case Study

El Salvador, the smallest country in Central America, is bordered by the Pacific Ocean on the south, Guatemala on the east, and Honduras on the north and west. Located in the western half of the country on the central plain, the capital city of San Salvador is linked to the rest of the country by highways and railroads. A Spanish colony until 1821, El Salvador became part of the United Provinces of



Source: Blutstein, Howard I., et. al. 1971. Area Handbook for El Salvador. Foreign Areas Studies, The American University, Washington, D.C.

Central America in 1823. El Salvador has been independent since 1838.

El Salvador has a per capita income of only US $314 (1974). Nearly half of the population is engaged in agriculture, although only 32% of the total land area supports crops. Most farmers are engaged in subsistence agriculture, producing beans, rice, and corn; coffee, cotton, and sugar are grown for export. Because so little of El Salvador's land is arable, much of the country's food must be imported. Among El Salvador's major problems is a high rate of population growth; the country has the second highest density in the Western Hemisphere. Other problems include poor housing, inadequate medical care, illiteracy, and malnutrition resulting from a lack of protein in the diet. The government of El Salvador first requested Peace Corps assistance in agriculture programs in 1962; marine fisheries volunteers were requested six years later.

Fisheries in El Salvador: An Overview

El Salvador has three good ports along a 160-mile Pacific coastline and for many years has supported a commercial shrimp fishery. Most shrimp produced is exported and never reaches the domestic market. However, during the 1960's most fishing in El Salvador was done on a subsistence level. Fish caught by fishermen were used primarily by their families; what fish were left over were sold in local markets. The fishermen of El Salvador were independent, illiterate, and for the most part, distrustful of the government even when offering aid. Fish processing consisted of smoking and drying fish; very often fish were not even gutted first. As a result, most fish sold at market were of very poor quality. Although there were good fishery resources off the coast, few fishermen had the proper equipment or boats large enough to fish in deeper waters far from shore. Fishermen had no history of cooperative action, and even though the government promoted the develop-

ment of fishermen's associations, few fishermen became members. When the government tried to promote gutting and icing of fish to improve the quality of fish reaching the market, people refused to buy them. Most people believed that fishermen only gutted and iced fish when they were about to go bad.

Recognizing these problems, El Salvador became part of a regional fisheries development program funded by the Food and Agriculture Organization (FAO) of the United Nations in 1965. The goals of this program were to improve the methods of production, harvesting, processing, and marketing of fisheries resources, solve nutritional problems, and promote the growth of commercial fishing industries.

The Central American Regional Fisheries Development Project

Early in the 1960's the Central American Economic Council (CEC), composed of El Salvador, Panama, Guatemala, Costa Rica, Honduras, and Nicaragua, requested help from the United Nations in response to widespread malnutrition, unemployment, and under and irrational exploitation of their living marine resources. In 1965 the Food and Agriculture Organization took up this request and designed the Central American Regional Fisheries Development Project. In 1966 the CEC created a Department of Fisheries (CCDP), composed of representatives from each country's national fishery agency, to serve as a counterpart to the FAO. The FAO and the six countries involved recognized the need for trained field staff to work with local fishermen, but such people were not readily available in any of these countries. The FAO suggested that perhaps Peace Corps might participate, and each country made a formal request to Peace Corps for assistance. As a result, Peace Corps recruited and trained 45 volunteers who were placed in six countries to work in various aspects of each country's fishery sector. El Salvador requested five volunteers to work with the Seccion de Pesca y Caza Maritima, the fisheries agency attached to the Ministry of Economics.

Peace Corps Involvement with El Salvadorean Fisheries

In 1967, the first Peace Corps group to work in the Central American Regional Fisheries Development Project was recruited and trained at Peace Corps' Puerto Rico Training Center and in Miami and St. Petersburg, Florida. The volunteers in this group had little experience in fisheries, although a few had biology degrees and had worked in some aspects of fisheries. They received training in the use of fishing gear such as gill nets, lobster traps, snapper reels, and long lines, and language and cross-cultural training. Training was fraught with difficulties due in part to bad weather which prevented much actual fishing, poor organization which resulted in speakers who did not show up, and the uncertainty until near the end of the training program of where each individual volunteer was to be placed. The training program, the first to be done on a regional rather than country-specific basis, was not considered to be a success even by the program's coordinator. Nevertheless, in December 1968 five volunteers arrived in El Salvador to begin work.

One volunteer, a marine biologist, was assigned to an FAO research vessel to do oceanographic research. This volunteer worked on board the SAGITARIO in the Pacific off El Salvador's coast. He collected and classified Central American fish species as part of a study with the University of Costa Rica. He also surveyed the spiny lobster fishery of El Salvador, and experimented with raft culture of mussels. Although nominally assigned to the Sección de Pesca y Caza Marítima, this volunteer was directly supervised by the FAO.

Three volunteers were assigned to coastal fishing villages to help form and administer cooperatives, improve methods of fishing, processing, and preserving fish, and provide other technical support to local fishermen. These volunteers worked in La Libertad, La Union,

and Acajutla along the coast. The fifth volunteer, a gear specialist, also was assigned to La Libertad to introduce new fishing gear and techniques to the fishermen in the cooperative. Although all of these volunteers were assigned to the Sección as well, most of their support and technical assistance was received from the Peace Corps and FAO.

The Government of El Salvador had chosen La Libertad as a "pilot project" site, and from the beginning most support and interest was shown to the cooperative and the two volunteers there. Fishermen in La Libertad had had bad experiences with cooperatives in the past, and although 60 fishermen were listed as members only 18 were active. The majority of the fishermen could not read or write, had few resources, and saw no reason to be part of a cooperative. There were no community organizers among them, and most preferred to remain independent.

The two volunteers began their work by conducting a survey of their area to determine the number of fishermen and boats, types of gear used, species and numbers of fish caught, how fish were marketed and the type of processing that was done. They began to work with fishermen, introducing new fishing gear such as monofilament gill nets, lobster traps, pargo and shark longlines, single hook lines and trammel nets. As the fishermen saw the usefulness of these new types of gear, more interest in the cooperative developed. The Sección de Pesca y Caza Marítima donated a boat and motor to the cooperative, and the gear specialist volunteer received a grant from the U.S. Agency for International Development that enabled him to purchase two more boats and motors. With this equipment, the cooperative members began to catch larger amounts of fish and the cooperative began to make some money. More fishermen joined the cooperative. It began to function more efficiently and capital was built up to be used for collective purposes.

As the cooperative grew, the cooperative specialist volunteer assigned to La Libertad organized it more efficiently, trained cooperative members in cooperative functions, established a bookkeeping system, and began to explore markets for the catch. Both volunteers promoted the smoking, salting and icing of fish, and by the end of their two years, construction had begun on an ice room and ice box in the cooperative building to store the catch until it was marketed. By the end of 1970, the cooperative at La Libertad had grown to 190 members, and its capital had grown from US $120 to US $12,000. By all accounts, this project was a success and the volunteers were able to see positive change during their stay.

The cooperative volunteers assigned to Acajutla and La Union also undertook surveys of their respective sites including number of fishermen and boats, types of gear used, and fishery catch statistics. The volunteer in Acajutla worked with lobster traps and a 50-hook longline for red snapper, and was able to get some interest in forming a cooperative started among the local fishermen. He was able to interest local businessmen in financing some experiments in fishing gear as well. The volunteer in La Union worked on modifying the local fishing boat, the cayuco, to enable it to be sailed farther from shore where fish were more plentiful. He added an outrigger, centerboard, and tiller, and taught fishermen new sailing techniques. The volunteer did not have experience in boat building and although the boat was large enough to handle modern gear and large catches, it was poorly designed and inadequately powered. However, the volunteer was able to stimulate local interest in boat design. He also introduced the use of clam rakes to local fishermen. Both of these volunteers received very little support from the government and as a result, their projects were not considered successful.

All of the volunteers in this group participated in an FAO fisheries marketing survey in El Salvador, and were supervised by technical experts of the FAO in certain aspects of their work. Volunteers were assigned to the Sección de Pesca y Caza Marítima but, except for the volunteers stationed at La Libertad, received little direction or material support from this fishery agency. The Peace Corps also had a regional director for this project who traveled from site to site advising volunteers and providing technical help. Volunteers thus received support and direction from the FAO and the Peace Corps, but little from their host country agency. As a result, there was much confusion over which agency ultimately was responsible for the volunteers. This issue was resolved eventually with a decision by Peace Corps that volunteers were responsible first to the Sección, since that agency had made the original request for volunteers.

Another problem that surfaced during this time was the different ideas the FAO and the Sección had about the role of volunteers. The FAO wanted volunteers to act as technical staff members, doing research on the development of large-scale commercial fisheries in El Salvador, while the Sección wanted volunteers to supplement their technical abilities and work in small coastal villages with artisanal fishermen. This problem was resolved in favor of the Sección, and when a second group of volunteers was requested by El Salvador to work in the Central American Regional Fisheries Development Project, it was clear from the start that they would be responsible only to the Sección de Pesca y Caza Marítima.

The Second Group of Volunteers

Peace Corps again recruited volunteers for the Central American Regional Fisheries Development Project, of which four were assigned to El Salvador. The volunteers had backgrounds in biology and received technical, language, and cross-cultural training in Puerto Rico and in Miami, Florida. This group was given instruction on fish marketing, cooperative structure and functions, boat engine maintenance and repair, and in construction of handlines, traps, cast nets, gill nets, and net mending. These four volunteers arrived in El Salvador in late 1970.

One volunteer was assigned to work as a marine biologist with the Sección de Pesca y Caza Marítima in carrying out biological studies on El Salvador's marine resources to help guarantee their rational utilization. The volunteer participated in studies on the ecology of lobster, cultivation of mussels in the La Union-El Tamarindo area, migration of post-larval shrimp, and collected and classified different marine animals for inclusion in a newly-created museum. Part of his work included advising the government on fishery administration policies.

Three volunteers were assigned to work as fishery extension agents to improve artisanal fishing techniques, improve existing cooperatives and organize new ones, and provide education in cooperation administration and management for cooperative members. One of these volunteers worked with a fishing cooperative that was formed in Acajutla helping to define and administer initial cooperative projects. The other two volunteers were assigned to La Libertad where they were to provide technical assistance on fishing gear and methods, provide education to cooperative members, introduce proper methods of processing, transporting, and marketing of fresh fish, and assist in the organization of other fishing cooperatives nearby.

One of the volunteers assigned to La Libertad set up an accounting system and trained three cooperative members in bookkeeping skills. He was able to convince them of the need to hire an accountant to manage the finances of the cooperative. He worked with fishermen, teaching the use of gill nets, but only five members were using gill nets by the time the volunteer left. However, faith in the cooperative continued to grow, and more fishermen were willing to work through the cooperative to market fish. When the two volunteers arrived 90% of the boats were owned privately by fishermen; by the time they left, over 60% of the boats were owned by the cooperative. Support for these volunteers came from the Peace Corps and FAO; the Sección's representative in the field felt threatened by volunteers and did not cooperate with them even though the Director of the Sección was favorable towards volunteer activities.

In 1971 FAO assistance to the Central American Regional Fisheries Development Program was completed, and FAO pulled out of fisheries development. Peace Corps was asked to continue its support to El Salvador, however, and a third group of volunteers was recruited as part of a larger program for El Salvador's rural development.

The Third Group of Volunteers

The Peace Corps recruited three volunteers for El Salvador in 1973. Two of the volunteers had degrees in fisheries biology, while one had a doctorate in zoology. The volunteers received language, cross-cultural, and a little technical training prior to their arrival in country. Two volunteers were assigned to work with the cooperatives in La Libertad and El Tamarindo (La Union), and the third worked as a university professor, teaching biology to students and training them in research methods.

The volunteer assigned to La Libertad was told to introduce whatever the cooperative needed, but the volunteer's background did not prepare him to give the kind of help the cooperative required at this stage of its development. They needed someone to help with marketing and fish processing, and this volunteer had no training in either subject. He left the cooperative after nine months and began an independent project on shrimp research. He arranged to go out fishing with a private shrimp fleet and conduct studies on shrimp populations. In the course of this work, the volunteer began to document a problem with overfishing in one shrimp area; he also found a new shrimp area that had not been fished before. Although he wished to complete a year's study of the area that was being overfished, the government asked him to work on the new area, so his research was never finished. He did have a counterpart, however, and was able to train him in scientific techniques. This volunteer felt his project was a success because he was able to get research started that was important to the development of a commercial fishery.

The volunteer assigned to the El Tamarindo fishing cooperative helped to set up the business and accounting system for the cooperative, but that job only took eight months. Although he retained an interest in the cooperative for the rest of his tour, the volunteer began doing research in oyster culture. He developed a methodology for the research and trained five technicians in identifying larval forms of oysters and conducting field studies, and helped them identify studies of their own. This project had support from the Ministry of Agriculture which had taken over the fisheries project, and from the U.S. Agency for International Development, which provided U.S. $1,000 for the research. Peace Corps did not support this project at all. Because this research was going so well, the FAO offered to give the U.S. $8,000 to continue the research and Peace

Corps recruited another marine fisheries volunteer to continue with this volunteer's work. However, the new volunteer lost interest and changed to a public health project. No other volunteers with a background in marine fisheries were available at that time, so the project stopped.

Of these three volunteers, the only one who felt he had been placed in a position commensurate with his abilities was the university professor. He was treated as a professional, and taught students and did research as he would in any university. Although there were some problems with other professors in the university, in general this volunteer was very pleased with his Peace Corps experience. Apparently so was the university; they asked him to stay as a full staff member at the completion of his tour and he did so. Throughout his tour this volunteer was given support by the university. He also felt that his Peace Corps training in language was excellent; he taught all his courses in Spanish.

After this group of volunteers, Peace Corps recruited several more in marine fisheries to work on individual projects, including assistance to new fishing cooperatives organized on the model of the cooperative in La Libertad. However, El Salvador's focus shifted to the development of freshwater fisheries in 1977 and most volunteers at this time are involved with freshwater fish culture, particularly of tilapia species.

Evaluation of the Project

Because the Central American Regional Fisheries Development Project was a pilot project for the Peace Corps, it was subjected to a series of evaluation reports beginning in 1969. The major statement made in all of these evaluations is that there was never a clear understanding among Peace

Corps, FAO, and the national fishery agencies of each country involved over which agency was responsible for the volunteers. The volunteers spent much of their time trying to figure this out for themselves, and thereby wasted time that could have been used more productively. One evaluation makes the point that the national fishery agencies were pressured into taking volunteers by the FAO, and that they did not understand why volunteers were there nor what it was they were supposed to do. Peace Corps itself was led to believe that FAO would provide financial and material support for the volunteers, and was very surprised when such support was not forthcoming. In El Salvador, the Peace Corps Director believed that support should not come from Peace Corps, but from the agency to which the volunteers were assigned. As a result, volunteers who were supposed to demonstrate new fishing gear often had no gear to work with until FAO or the Sección de Pesca y Caza Marítima was able to give it to them.

Other evaluations make the point that training received by volunteers did not prepare them adequately for their roles, especially those working with cooperatives. Volunteers with biology backgrounds needed more understanding of the functions of cooperatives, accounting methods, and fish marketing and processing. Peace Corps is criticized also for failing to prepare adequate volunteer job descriptions, with the result that of three volunteers in the last group, two changed jobs within the first year. However, the marine fisheries projects in El Salvador usually are considered to be successful both by Peace Corps and by the volunteers themselves. Volunteers were able to make a difference in the development of fishing cooperatives and introduce new fishing gear and methods to artisanal fishermen along the Pacific coast of El Salvador.

Successes and Failures

Although the Central American Regional Fisheries Development Project failed to work on a regional basis, individual projects within El Salvador were successful. The reasons behind both successes and failures in El Salvador marine fisheries projects include these:

- Although Peace Corps failed to get a clear understanding of which agency was to be responsible for the volunteers, they did provide a regional coordinator who gave technical direction and supervision to volunteers who were caught in the confusion. This coordinator worked with Peace Corps staff in El Salvador to ensure that volunteers were supported.

- The FAO, more interested in research for commercial fisheries, nevertheless supported volunteers working in artisanal fisheries when it became clear that that was the role the Sección and Peace Corps had in mind.

- Even though the Sección may have been pressured into accepting volunteers, it was able to impose some of its own priorities on the project, placing five volunteers in its pilot site of La Libertad. These volunteers all received excellent support from the agency and the results justify that support. However, volunteers at other sites were more or less ignored by the Sección, and they had few lasting successes.

- The first group of volunteers had little background in marine fisheries, and their training was not adequate to prepare them for their jobs. The support they received in the field, however, enabled them to overcome this deficiency (except for volunteers placed in areas not given priority by the government). The second group of volunteers benefitted from the first group's experience; they were placed in sites that had priority standing with the government, even though most support still went to La Libertad.

- Volunteers were able to begin research in several marine species that could provide food for Salvadoreans. They trained counterparts in the use of simple scientific techniques and left several projects in their hands.

- Artisanal fishermen were distrustful of volunteers at first because they were associated with a government agency. Volunteers were able to change some attitudes and gain the interest of local fishermen by becoming part of their community. This led to involvement of fishermen in fishing cooperatives. Volunteers also received good language training which they felt helped them to communicate at all levels in El Salvador.

It is clear from the discussion of these projects that much of the success of a project in El Salvador depends upon the amount and kind of support given to volunteers. Those with good support from the government were able to do more than those who received only passing interest. It should be remembered that those projects that received the most aid were the projects given priority by the government. Even without much support, however, individual volunteers were able to do research, train counterparts, and contribute to the development of new food resources for the country. The original purposes of these projects were to promote the growth of commercial fisheries, improve production, harvesting, processing, and marketing, and solve nutritional problems in El Salvador. Volunteers were successful in moving the country towards these goals.

Philippines Case Study

Source: Vreeland, Nena et. al. 1976. Area Handbook for the Philippines. Foreign Area Studies. The American University, Washington, DC.

The Philippines, an archipelago of over 7,100 islands, is located along the southeastern rim of Asia between the South China Sea and the Pacific Ocean. A tropical country, the Philippines has a uniform temperature year-round, with rainfall adequate for most agricultural needs. Quezon City, the country's capital, is located on Luzon, the largest and most populated island. Claimed by Magellan for Spain in 1521, the Philippines remained a Spanish colony for nearly three hundred years. With the end of the Spanish-American War, the country came under American rule. The Philippines finally gained its independence in 1946, although it retains close ties to the United States.

The Philippines is a fairly developed country in comparison with many other developing countries and supports an industrial complex that includes mining, manufacturing, and construction. Industrial production

accounts for 35% of the country's gross national product. Agriculture, for both domestic and export markets, accounts for only 10%. Most agriculture is done by small farmers who produce rice, corn, and vegetables for family use; however, such cash crops as sugar, coconuts, and tobacco are grown for export. Over half of the population is engaged in agriculture of some kind, and 70% of all cultivated land is planted in food crops. Most small farmers in the Philippines subsist on a diet of rice, vegetables, and fish, with few other protein foods eaten except on special occasions. As a result, there are problems with malnutrition and diet-related diseases, especially among young children. This is exacerbated by the high rate of population growth in the Philippines. In recent years, the Philippine government has sponsored programs in rice and corn production, with the result that for the first time the country was marginally self-sufficient in rice production in 1977. However, the lack of protein in most Filipinos' diets continues to be a problem, and the country is trying to close this gap by promoting both inland and marine fisheries development. The Peace Corps was invited to help in fisheries development in 1971.

Fisheries in the Philippines: An Overview

Although the Philippines has a coastline of over 10,000 miles, in 1971 there had been almost no development of marine fisheries on a commercial scale. Most fishermen went out to sea in small, dugout canoes equipped with outriggers, called bancas, and were able to catch only enough fish for their families' needs with a few left over to sell at the market. The Philippines had an estimated 600,000 small-scale fishermen who were fishing with bancas, 80% of which were not motorized. Fishermen continued to use traditional methods and equipment, even when they were aware of newer techniques, because little credit was available to help

them purchase new fishing gear, and fishermen did not qualify for what credit was available. Few fishermen belonged to cooperatives, and fewer still had access to extension services or marketing facilities. The Philippines did have a fairly developed brackishwater fish pond industry, in which fry caught along the shore were raised to marketable size in fish ponds. However, such fish ponds were only available to those with some capital to invest, and most small scale fishermen did not participate in that kind of development.

Recognizing the need to get more protein to the people, in 1971 the Philippine government's National Food and Agriculture Council and the Philippine Fisheries Commission began a program to promote fish pond development throughout the country. Peace Corps was invited to participate in this program, and the first group of fisheries volunteers arrived later that year.

Peace Corps Involvement with Philippines Fisheries

The first group of fisheries volunteers arrived in 1971 to work at government fish farms to produce fingerlings that would be distributed to small farmers for their backyard fish ponds. These six volunteers worked for the Philippine Fisheries Commission, an agency of the Department of Agriculture and Natural Resources. In 1972 a second group of fisheries volunteers was requested to work both in fingerling production and in brackishwater extension. These 27 volunteers were trained in the Philippines, receiving technical language, and cross-cultural training at three different sites. During their two years in the country, the Commission was elevated to a bureau, the Bureau of Fisheries. Due to the success of the first two groups, the Bureau requested a third group of volunteers to work in brackishwater extension. This group, including 19 volunteers, many of whom had advanced training in fisheries biology, arrived in 1973. Shortly thereafter the Bureau changed its name to the Bureau of Fisheries and Aquatic Resources (BFAR) under the ministry of Natural Resources.

Although none of these three fisheries groups were assigned to work with marine fisheries, individual volunteers did get involved with marine resources. For example, one volunteer from the second group worked with seaweed production, while another did research on eels. A volunteer from the third group began a research project in mussel culture in a sheltered bay off the island of Panay. However, it wasn't until the arrival of the fourth group later in 1973 that any volunteers were directly assigned to marine fisheries work.

The four volunteers in the fourth group were the first volunteers to be assigned to the Marine Fishery Biology Division and the results of their work were useful in developing and improving on-going research projects. These volunteers also helped BFAR identify other research needs, and by the middle of their tours, 17 other research positions were being requested from the Peace Corps. Only one of these volunteers, however, was actively involved in marine research. This volunteer was assigned to investigate oyster culture in a bay near Manila. His objectives were to investigate the feeding habits of oysters, compare the production of oysters by different methods, compare the growth rates of oysters in natural beds and under controlled conditions, and investigate the seasonal fluctuations of the planktonic food of oysters in the bay. The success of his research project led to the request for another group of volunteers, including one assigned to do marine research.

The fifth group of fisheries volunteers consisted of 11 volunteers; two in research, three in fisheries planning, and six in extension. Only one volunteer worked in a marine environment. This volunteer was assigned to work with a private organization, the Filipinas Foundation, helping them do research on the culture of shrimp. She did research on feeds, growth in controlled environments,

and other research requested by the Foundation. With the completion of these studies, the Foundation began production, and the volunteer was replaced by a Filipino. The volunteer then moved into freshwater research with the National Pollution Control Commission for the remainder of her tour.

The next group of fisheries volunteers arrived in 1975. This group included three marine fisheries volunteers, of which one worked with fishermen to continue the mussel project begun by a previous volunteer, and one did research on developing a shark fishery. The mussel project, originally funded by a local municipality, had expanded to become a model mussel farm under the auspices of BFAR. The volunteer assigned to the farm served as the liaison between the municipality and BFAR, and worked on marketing of the cultured mussels. The second volunteer worked with local fishermen to develop a spiny dogfish shark fishery to provide income to subsistence fishermen in Mindanao.

As part of this project, a private boat company donated a fiberglass dory to the volunteer to enable him to go out and survey dogfish shark populations to determine if such a fishery was feasible. This volunteer was able to complete his research, leaving behind a report describing the use of long bottom lines for shark fishing, a key to identifying sharks for commercial purposes, and a description of four species of sharks and their possible uses. As a result of his research, subsistence fishermen in the area have been fishing successfully for sharks and thus have a new source of income.

One of the volunteers was assigned directly to the BFAR Research Division at the Central Office in Manila with the job of identifying all the fish eggs and larvae in marine plankton samples taken by BFAR biologists on their research ship. The Bureau had selected 13

marine areas around the country that were thought to be important nursery areas for commercial fish species, and was trying to identify which species were important in which areas. The Bureau hoped to quantify the fisheries potential for these areas prior to promoting the development of a large-scale fishing industry offshore. The volunteer also worked with BFAR biologists to re-orient the project and standardize sampling methods.

Another volunteer submitted a research proposal on coral reefs in the Philippines as a special project to the Director of BFAR with the objectives of determining the extent of reef areas and their contribution to the fisheries resources of the Philippines. This volunteer worked on generating baseline ecological research data to support measures to preserve important reef areas. This project was funded by BFAR and received support from the Smithsonian Institution in the form of literature. The project leadership for the coral reef project was given to the volunteers, and they completed a survey and submitted the data generated to the Research Division.

The First Marine Fisheries Group

The Bureau of Fisheries and Aquatic Resources continued to request fisheries volunteers for a variety of positions, primarily for areas where lack of trained manpower was evident. In 1976 the BFAR began to develop programs in marine fisheries, designed both to identify marine resources and to protect valuable fishery areas. As part of this program BFAR requested another fisheries group, which was to include marine fisheries volunteers. The seventh fisheries group arrived in 1976, and in this group there were volunteers with degrees in biological oceanography, ecology, natural resources management, and marine science. Out of the group of 24 volunteers seven were assigned originally to

marine research, while the remainder were involved with inland fisheries extension and research. The marine fisheries volunteers received language, cross-cultural, and technical training. During their training program they were introduced to the different groups involved with marine research in the Philippines, and were given an orientation by BFAR staff on the marine research program goals.

One of the marine fisheries volunteers was assigned to BFAR's Central Office in Manila along with a previously-assigned PCV to work in the hydrobiological survey in the 13 regions of the country as an assistant team leader. He also assisted in managing the operations of the Metro Manila Aquarium at the Philippine Village, and on the coral reef project.

Two volunteers were assigned to the Marine Sciences Center, University of the Philippines as a result of the Center's request for marine biologists. Both PCVs were assigned primarily to the Coral Reef Survey Project; one was directly responsible to the Center in Manila and the other PCV was assigned to the Marine Station in Cebu City. One of these PCVs and a volunteer assigned to extension wrote a joint proposal to start a mussel culture and research project under the Blue Revolution Program in Tayabas Bay off Luzon. The volunteers constructed mussel plots and planted the mussel seeds. With the help of the Center's laboratories these two volunteers were able to begin production of mussels after a baseline survey on population density. On their recommendation, BFAR hired a recently graduated Filipina to work with them. When they left, she became the project leader and another volunteer was assigned to the project as technical advisor. This project was considered a great success by everyone connected with it, and it received good support from local people as well as the University and BFAR staff. The volunteer assigned to the Marine Science Center at the

University of the Philippines also created a research library to help with this and the coral reef project.

Another volunteer was assigned as a marine fisheries researcher at the District Fisheries Office in Puerto Princesa, Palawan. He submitted a research proposal to do a biological survey of commercially important species of Honda Bay with the final objective of determining the future fishing potential in the bay. This volunteer was given the authority to hire two junior biologists to assist him in this project. As an offshoot of this project, BFAR funded the publication of "Philippine Shore Fishes of the Western Sulu."

Another volunteer in this group was assigned to do tuna research on the island of Mindanao. The volunteer was given an unused fisheries station to set up as an office and was allowed to select his own co-worker, a college graduate from a local university. The objective of this project was to survey the tuna catch, methods of capture, and effectiveness of capture methods, and to develop charts showing yearly populations and migrations of tuna in the area. The project was funded by BFAR, although halfway through additional funding was received from the Philippine Council on Agricultural Research. Eventually the volunteer was able to recruit eight more staff members from other BFAR offices to work on this project. The volunteer wrote a paper on the tuna industry and made recommendations for future improvements. Another volunteer was assigned to this project at the end of this volunteer's tour as a technical assistant.

Other volunteers in this first marine research group worked on an artificial reef project proposed by a volunteer and supported by the Marine Sciences Center, the U.S. Navy and Air Force, and the U.S. Agency for International Development. Working with local fishermen, the

volunteer who proposed this project was able to build four artificial reefs offshore of a small coastal village to help improve the fisheries resources of the area. He was able to develop a library for the village as well. Other volunteers in the group worked on oyster culture, coral reef research, and fisheries education of fishermen.

Volunteers Continue in Marine Research

In 1977 another group of fisheries volunteers arrived in the Philippines, of which five were assigned to marine fisheries research. These volunteers had degrees and experience in marine biology, and received technical training in aquaculture as well as language and cross-cultural training. Two of these volunteers were assigned to an island in the Cebu region, one to do research on the rabbitfish, and the other to develop a seaweed demonstration farm. The volunteers were supported by BFAR funding, although they did not at first have any counterparts. The volunteer working on rabbitfish did general ecological research on the different species of rabbitfish in the area, selected the species that grew best, and was able to spawn and grow the fish in cages suspended in the ocean. Eventually a local fisherman was hired and trained to take over this project as BFAR project leader. The volunteer working on the seaweed farm was able to start the first seaweed project in the region for BFAR. Both volunteers felt their projects were successful because they were oriented to providing immediate results that could be used by local people to improve their situations.

In 1977 a small group of volunteers were recruited to work as fisheries educators, and in 1978 another marine research group arrived. This latest group of researchers is working as municipal fisheries extensionists, mariculture extensionists, fishery products

cechnologists, ice plant technicians, and statisticians. Most of these projects provide services to the subsistence fishermen, including improving processing and marketing facilities, providing technical support, increasing their incomes, and improving the level of information about marine resources of the Philippines. Peace Corps anticipates that volunteers will continue to be recruited for marine fisheries projects in the Philippines at least through 1982.

Evaluation of the Project

Although most of the fisheries projects in the Philippines have not been evaluated formally by the Peace Corps, it is generally understood that these projects are among the most successful that Peace Crops has ever had. Marine fisheries projects, however, are fairly new and there have been some problems in orgainzation and management of marine projects within the Bureau of Fisheries and Aquatic Resources. Technical staff of BFAR have participated in the training and job placement of volunteers recruited for extension and fingerling production since the first group arrived in 1971. Techniques for training marine volunteers had never been used before. With the success of programs for self-sufficiency in rice and corn from the so-called "Green Revolution", the Philippine government launched a new program called the "Blue Revolution" designed to reach self-sufficiency in fish production. Thus, there was plenty of money for projects, especially those investigating the potential for commercial fisheries, and support from BFAR was very good. The Peace Corps/Philippines Country Management Plan for 1977 makes the following statement: "... self-sufficiency in fish production is high in the priority list of the Philippine Government. The only main drawback of PC/P involvement in this effort is our inability to supply the required number of volunteers. Nevertheless, the

program is making a significant contribution to the Philippine effort, enjoys the full support of the HCAs (host country agencies) concerned, and affords the volunteers the opportunity to relate with Filipinos in various areas and from all walks of life. Hence, it now ranks as the top priority program of Peace Corps/Philippines."*

Throughout Peace Corps involvement with fisheries there has been excellent support from the Director of the Bureau of Fisheries and Aquatic Resources, and from his central and regional office staff. Most volunteers have stayed for their full two-year tours, while many have extended for a third year to complete their work. Credit for the success of fisheries projects has been due also to the Peace Corps' fisheries program managers who have worked closely with the Bureau and with volunteers in the field. In summary, volunteers have been able to increase fish production, improve the level of knowledge about marine resources, introduce cultivation of new food resources, and train Filipino counterparts in scientific techniques. Both the Peace Corps and the Philippine Government consider marine fisheries projects worthwhile and plan to continue working together in this field.

*U.S. Peace Corps/Philippines. 1977. Philippines Country Management Plan.

Successes and Failures

The marine fisheries projects in the Philippines, though very new and still in a trial period, have had success due to several factors, including these:

- The Bureau of Fisheries and Aquatic Resources gave support to all volunteers in terms of good planning of projects, good job placement, funding for volunteers' projects, equipment and materials and counterparts. When counterparts were not available volunteers were given the authority to hire and train their own. Many of these counterparts then became

project leaders after the volunteers left. In the past volunteers spent a good deal of time preparing project proposals for funding: however, this has been changing and new volunteers are able to move right in to work on a project that has been funded before their arrival.

- Support from the Peace Corps has been excellent as well. The Peace Corps' fisheries program manager served as liaison between volunteers and BFAR, worked with BFAR planners to develop new projects, visited volunteers at their sites, and provided technical support in terms of literature for volunteers in the field. Since 1973 there have been three different program managers, but all have been able to continue this support.

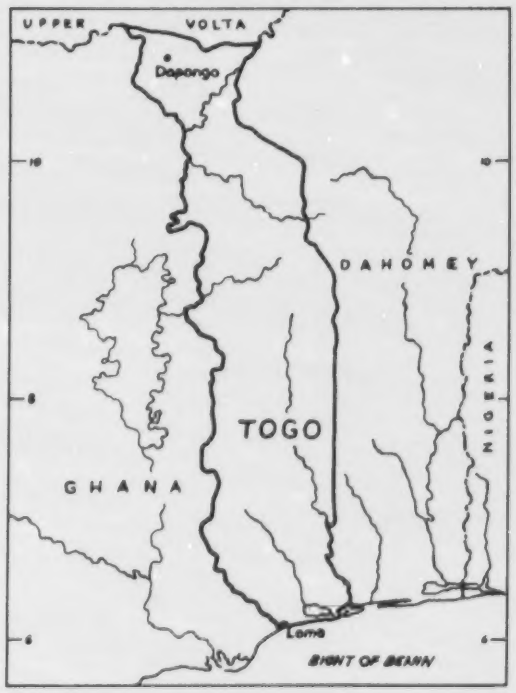
- All volunteers in the marine fisheries projects have been trained in the Philippines. Even though most of their training was in language and cross-cultural studies, volunteers were able to see how fisheries in the country operated, and most felt prepared to begin their work within a short time. Most educated Filipinos speak English very well, and all scientific work is done in English, so volunteers did not have problems with language. However, most volunteers learned local dialects as well in order to communicate with local fishermen.

- Filipinos in general are very receptive to Americans. Volunteers were always accepted and found it easy to make friends and socialize. However, there were some misunderstandings between volunteers and co-workers over scientific practices.

In summary, most marine fisheries projects in the Philippines have been successful and have contributed to the health and well-being of Filipinos. Fisheries projects are a top priority for the Government of the Philippines and, rightly so, for the Peace Corps as well. Future projects will utilize skill trained volunteers who will provide assistance to small fishermen by improving traditional fishing techniques, forming cooperatives for better marketing of fish, and providing technical advice through extension services to help increase their income and provide more fish for the diets of all Filipinos.

Togo Case Study

Togo, the smallest French-speaking nation in Africa, stretches 360 miles north to south between Benin (Dahomey) on the east and Ghana on the west, and is bordered by Upper Volta to the north. Lome, the capital and largest city, is located along the 35-mile-long coastline bordering Africa's Gulf of Guinea. At one time a German colony, Togo became a French protectorate after World War I, and finally was granted its independence on April 27, 1960.



Source: Togo Official Standard Names Gazette No. 98, United States Board on Geographic Names, 1966.

Togo is a very poor country; in 1962 the average per capita income was only US $80. Today Togo is considered by the U.S. Congress to be one of the 49 countries most in need of development assistance. Togo's biggest problems relate to a lack of capital to finance development, and include inadequate medical care and facilities, poor housing and environmental sanitation, and illiteracy. The biggest problem, however, is the lack of adequate protein in the diet and the resulting malnutrition. These problems are exacerbated by the

high rate of population growth. As a result of these problems, in 1962 Togo began to consider improving several aspects of agriculture, including fisheries, and invited the Peace Corps to participate.

Fisheries in Togo: An Overview

Although Togo has a coastline and therefore access to the sea, the country does not have a history of involvement with marine fisheries. Togo's coast is primarily a low, smooth sandy beach, broken by occasional marshy creeks and mangrove swamps. The port at Lome, built by the Germans in the last century, is the only major facility available for large ships. Most coastal fishermen in 1962 were using small boats or canoes called pirogues, which were carved out of a single tree. Pirogues were heavy, difficult to handle, fairly unstable and often capsized in the heavy surf that characterizes Togo's shoreline. Fishermen would row these boats out and cast their nets in areas close to shore. Most fishermen were able to catch only enough fish to feed their families, but sometimes a few fish were left over to sell at market. Although there were good fishery resources in the deeper waters off the coast, most small fishermen could not go out that far to fish. Often commercial fleets of other nations would trawl within sight of shore, and sometimes these trawlers would dock in Togolese ports and sell the fish they caught in Togolese waters at prices that undercut the small fishermen. The Togolese government recognized the need to improve the fishing methods of coastal fishermen in order to allow them to take more fish and sell them at lower prices, both to provide more income for fishermen and to provide protein at a price more people could afford. Because Togo lacked the expertise and the financing necessary to develop their coastal fisheries, the Togolese government asked for assistance from the Peace Corps.

Peace Corps Involvement with Togo Fisheries

Upon the request of the Togolese government, in 1962 the Peace Corps recruited eight volunteers from the Gloucester, Massachusetts area of New England. All of these volunteers had some commercial marine fishing experience. For example, one volunteer had spent 15 years in a Federal government agency designing fishing methods and equipment, while others had gone out on commercial fishing vessels as crew members. Together with 39 other volunteers who would be teaching English in Togolese schools, these volunteers went through a training period at Howard University in Washington, D.C. The volunteers were taught French, the official national language of Togo, and given a minimal amount of information on the culture of the country. The marine fisheries volunteers were not given any technical training since it was assumed that they already had the necessary experience for their jobs.

Upon their arrival in Togo, the eight marine fisheries volunteers were divided into three groups, each of which had a different site location and different objectives. Four volunteers were assigned to the coastal town of Anecho to engage in the general improvement of the fishing techniques and gear used by coastal fishermen. Two volunteers were assigned to the town of Togoville to concentrate on demonstrating trap fishing and the use of gill nets. Two others were assigned to Dapango in northern Togo on a long-range project to develop inland fisheries. All eight volunteers were assigned to work through the Togolese Fisheries Service, the Service des Pêche, an agency of the Ministry of Agriculture.

The two volunteers assigned to inland fisheries development had difficulties from the beginning since they had experience and training in marine fisheries rather than freshwater fisheries. However, they attempted to apply their knowledge of fishing equipment and

methods to the freshwater situation and had some success. In the course of their work they discovered that the French had tried to introduce fish culture in ponds during the 1950's, and had built four fish stations, which were abandoned when the French left. These volunteers began working with these stations, but could not do very much since they had no real understanding of the principles of fish culture and freshwater fish species.

During the first year of the project, the six volunteers assigned to work with coastal fishermen attempted to teach the Togolese basic equipment maintenance such as how to mend nets and rig tackle, and new fishing techniques including how to make cages and traps for lobsters, and how to use a gill net. One volunteer, noticing that fishermen used too much energy pulling and dragging their pirogues up onto the beach, introduced the use of rollers under the boats. All were able to introduce the use of nylon nets and plastic corks and other synthetic fishing gear. The equipment used was provided by the Peace Corps and by private commercial manufacturers who gave large discounts and occasional donations for this program. Support from the Service des Pêche was minimal; the agency was very new, understaffed, with few people trained in fisheries biology, and was not able to provide either material goods or trained counterparts for the volunteers. The request for marine fisheries volunteers had not come from the Service, and it was not convinced of the need for such projects. One volunteer worked with a fisheries expert from the Food and Agriculture Organization (FAO) of the United Nations who was assigned to the Service des Pêche. The Togolese government, however, did provide housing for the volunteers.

Several volunteers tried to promote the use of outboard engines to enable the fishermen to 1) get farther out to where fish were more plentiful, 2) spend less time and energy fishing for an equal amount

of fish or increase the catch per unit effort and 3) have leisure time during which they could be taught other techniques and methods to improve the catch or decrease the amount of time spent fishing. However, this didn't work for several reasons:

- Pirogues often capsized, wetting the engines which required dismantling the engines, drying and re-assembling them. Few fishermen had the abilities or interest to take on such a job.
- Outboard motors and gasoline were very expensive, especially when the majority of fishermen had no cash income. Credit systems to provide engines and fuel were not available.
- The use of motors cut down on time spent fishing, but did not increase the catch. Time is the one thing that most fishermen had, so decreasing the time spent fishing was not an advantage to the fishermen.

After several attempts, the volunteers involved in outboard engines gave up on this aspect of their work.

While the volunteers were there, they often saw Russian trawlers fishing in Togo's offshore waters. Several times the Russians unloaded boxed, iced fish and sold them in the markets, where they were able to undersell local fishermen. Volunteers realized that, in order to compete with other commercial fishermen, the Togolese would have to get involved in commercial fisheries development. Through an arrangement made by the Peace Corps, the volunteers were provided with a large purse seine that needed repair. With the local fishermen, the volunteers repaired the net and made arrangements with the captain of a Dahomeyan trawler to go out and fish with the net. The volunteers had two purposes in mind: to convince coastal fishermen that there were plenty of fish offshore and that the use of modern equipment and methods and larger boats would enable fishermen to catch large amounts of fish and thereby change their way of life. Although it is not clear what happened, it appears that the volunteers and the fishermen never

went out to fish with the purse seine. Volunteers recommended that Peace Corps provide a smaller trawler to the Togolese Service des Pêche to continue this work, but Peace Corps never pursued this idea because the German government had just bought two larger trawlers as part of an FAO program in Togo. The volunteers then gave up this project too.

Out of the original eight volunteers, five terminated and left Togo before their two-year tour of duty was completed. Only one volunteer stayed along the coast working with the coastal fishermen, teaching them to make lobster traps and catch crayfish, which they sold to the wives of the diplomatic corps in Lome. The two others moved into the development of inland fisheries. (Whether these are the same two originally assigned to inland fisheries development is not clear.) In discussions of this project it is called a disaster, since the marine fisheries component failed. However, the volunteers associated with the project did not consider it a failure, since they were able to introduce new techniques such as the use and maintenance of gill nets, lobster traps, and the use of rollers to bring boats up onto the shore. But the Togolese government's main goal, to increase the amount of protein in people's diets, was not met.

Evaluation of the Project

This project was one of the Peace Corps' first technical assistance projects, and as such was given a lot of publicity. In an evaluation* done in 1963 while the volunteers were still in Togo, the evaluator made this statement: "The Togo fishing project is unquestionably the most overpublicized Peace Corps activity anywhere in the world. More nonsense has been written about these 'hardy

*Cook, Philip S. 1963. Togo Evaluation Report. U.S. Peace Corps.

New Englanders' and, as the volunteers themselves are quick to point out, 'No one yet has asked us the key question ... Are we catching more fish?' The answer, regrettably, is 'No.'" After this project, the Government of Togo again requested fisheries volunteers, but this time they were all to work in inland fisheries. This second group of volunteers was sent to drought-parched central Togo where the lack of protein in the local diets was most critical. But these volunteers were not trained in fish culture either, and most felt unable to do their jobs. The Togolese did not support the effort to develop fish culture stations. When individual volunteers were able to begin producing fish at an old, abandoned fish station they finally were convinced that it had possibilities. As of 1966, Togo requested 15 volunteers to work primarily in fish culture, extension, and the building of dams for water supply for fish ponds and for domestic uses. However, by 1968 it was clear that the Togolese government was not supporting the fish culture efforts, and no further programming in fisheries projects of any kind was done. In 1970 the Service des Pêche requested a marine biologist to assist their freshwater fisheries project but it does not appear that this request was filled.

Successes and Failures

This project as a whole was considered a failure from Peace Corps' perspective, and from the point of view of the Togolese government's goals. Several points can be made that help to identify what went wrong with the project:

- Although the Togolese government requested these volunteers for a marine fisheries project, the Service des Pêche did not fully support it from its inception. The Service did not give support of any kind to the volunteers, and was not convinced of the need for their help.

- The Peace Corps volunteers were given little understanding of the situation in Togo, and were not supported by Peace Corps when they tried to change their job focus, although they did receive support in terms of money and equipment. Volunteers were trained in French, and although most educated people did speak French, they found that coastal and upland fishermen are more comfortable speaking a local language, of which the volunteers had no knowledge. In addition, there was no technical advisor assigned to the Peace Corps staff, so volunteers often went to the FAO fisheries advisor for help on technical matters. The FAO advisor ended up using the volunteers for FAO projects rather than Peace Corps projects.

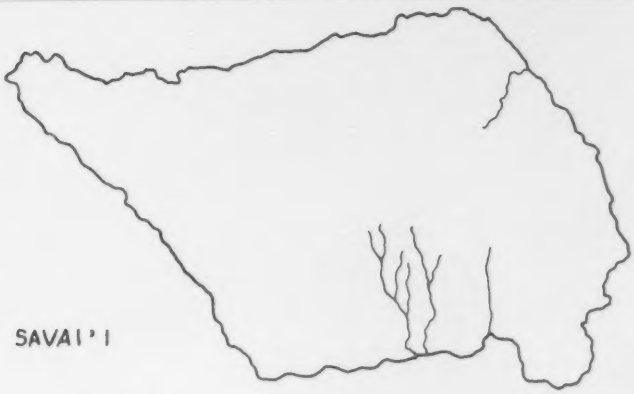
- The target population of the marine fisheries volunteers, the coastal fishermen, had not asked to be given help, viewed the fisheries volunteers with the skepticism reserved for "white men", and did not feel the need to reduce the time spent in fishing, which was their major occupation. They also regarded the volunteers as guests, to the extent that they would not allow the volunteers to help with the rowing when they went out to fish.

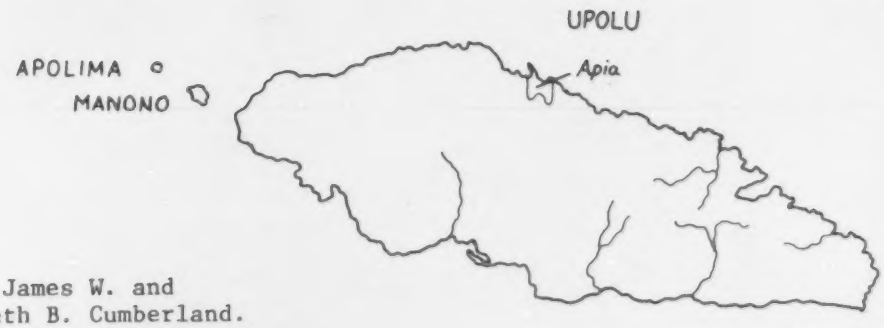
- Volunteers did have money and equipment from the Peace Corps and from FAO, but doing the job they wanted to do required even larger amounts of money and a boat. Such support, however, was not going to be available to fishermen after the volunteers left.

Despite these problems, some volunteers were able to transfer knowledge about fishing gear and methods to the coastal fishermen. However, the major goal -- to provide more fish and therefore increase the amount of protein in local diets -- was not met.

Western Samoa Case Study

Western Samoa, a group of nine volcanic islands ringed by coral reefs, is located in the South Pacific northeast of New Zealand. Only the largest islands are inhabited -- Upolu, Savai'i, Apolima, and Manono. Apia, the capital city located on Upolu, is home to one-fourth of the country's population. Western





Source: Fox, James W. and Kenneth B. Cumberland. 1962. Western Samoa. Whitcombe & Tombs, Ltd. Christchurch, New Zealand.

Samoa was a German colony prior to World War I. At the end of the war, the country was mandated to New Zealand by the League of Nations. Although Samoans had been participating in self-government since 1954, the country did not receive its independence from New Zealand until January 1, 1962.

Western Samoa is a politically stable parliamentary democracy, and has few problems with malnutrition or extreme poverty. Most villagers are engaged in subsistence agriculture, although a few large plantations produce copra, cocoa, and bananas for export. The soil of Western Samoa is volcanic but not very fertile; as a result, much of the country's food must be imported. Because most of Western Samoa's foreign exchange earnings are from three export crops, the country is very dependent upon fluctuations in the world prices for these products. The fluctuations coupled with the cost of importing basic food stuff result in a large balance of trade deficit. The Western Samoan government, recognizing the need to reduce this dependence on imported food and decrease the deficit, requested Peace Corps assistance in developing the agricultural and fisheries potential of the country.

Fisheries in Western Samoa: An Overview

Surrounded by water, the Western Samoans always have been associated with the sea and its resources. Samoans are full-blooded Polynesians, and they have a great pride in the fishing and navigation skills of their ancestors who originally migrated to these islands. Over the centuries, however, the Samoans have lost the skills and knowledge needed to fish in the open sea, and by the 1960's most fishing was done from canoes and catamarans in the lagoons behind the barrier reefs that surround the islands. Much of this fishing was done on a subsistence level with only a few fish reaching the marketplace. However,

as the population grew, more and more people came to depend upon fish for the protein in their diets. As a result, the lagoons were being overfished. Fishermen tried to go out beyond the barrier reefs to fish, but their boats and fishing methods had been developed for the calmer, shallower waters of the lagoon, not for the open sea. Other countries, particularly Japan, were fishing in the deeper waters off Western Samoa's shores and getting large catches, which they processed and sold back to the Samoans in cans. There is a skipjack tuna fishery just offshore that experts believe would allow an annual harvest of 150,000 tons of fish without seriously depleting the population. Western Samoa's government, recognizing the need to reestablish the local fishery capability and to develop a new commercial fishery, set up a Fisheries Division within the Department of Agriculture in 1970. This new Division requested the assistance of the Peace Corps in planning programs for municipal and commercial fisheries development.

Peace Corps Involvement with Western Samoan Fisheries

In 1970, one volunteer was present at the signing ceremony that created the Fisheries Division. He worked with the new Director in setting up programs. The first program they set up was an outboard engine repair training school to teach repair and maintenance to local fishermen. The Government of Western Samoa previously had introduced outboard motors to fishermen, but few had an understanding of the need for proper maintenance, and many engines had fallen into disrepair. Fishermen had spent many hours trying to fix engines, and time lost in repair or paddling their boats home meant fewer fish were caught. The Fisheries Division hoped that fishermen trained at this school would return to their villages and teach others to maintain their engines. The school was well-liked by fishermen, partly because it included a repair shop which had tools not usually accessible to villagers. A second school was started later on in another location to continue this

training. Most of the support for the school was given from the Fisheries Division and from international donor organizations.

The second program that the volunteer and the Director were interested in was the development of a fishing craft that could go out into the open seas to fish. After some research the volunteer found a design that looked promising: a fishing craft used in the islands in the 1880's but forgotten during this century. Called the "alia", this boat was larger than local canoes but more stable. Using village labor and locally available materials, the volunteer supervised the building of several alias, and equipped them with outboard engines. These boats were a great success, and proved to be very useful in the open sea. Fishermen were receptive to the reintroduction of the alia, especially because it was one of their own traditional designs, and not imposed upon them from the outside. This project also was given support from the Fisheries Division in terms of materials and financing.

Based upon these successes, in 1971 the Fisheries Division requested volunteers to work in four projects: the development of fisheries associations in local villages to help in marketing of increased fish catches, the establishment of a turtle hatchery and farm, the development of a skipjack tuna fishery, and the development of a prototype ferrocement boat.

The Second Volunteer Group

Upon receiving the Western Samoan government's request, Peace Corps recruited three volunteers in 1971. All three had either experience or education in marine biology. For example, one volunteer with a degree in marine fisheries biology also had five years of experience in deep sea cruises at an oceanographic institution. As a result, the volunteers received no technical

training, but they did receive language and cross-cultural training prior to their arrival in-country.

Two of these volunteers worked in the development of fisheries associations, training local fishermen in new fishing methods and the use of improved fishing equipment. They also taught repair and maintenance of outboard engines. Apparently at this time volunteers also built the first ferrocement boat in the South Pacific; however, it is not clear if this boat was appropriate for Western Samoa, nor if the boat was ever used.

The third volunteer was assigned to design and build a turtle hatchery. Samoans eat the eggs and adults of two species of sea turtles which breed on remote beaches in the islands. The turtles eaten are the green and the hawksbill, both of which are endangered species. Exploitation of these turtles was further endangering their existence, so the Western Samoan government devised a plan to both protect turtles and increase their productivity. The Fisheries Division wanted to build a hatchery where eggs collected on the breeding grounds could be hatched safely, and the baby turtles returned to the beach and released into the sea. The government also hoped that, after doing research on the turtles' life cycles and food habits, it would be possible to farm these turtles on a commercial basis, thus providing the local people with another way to generate income.

The volunteer working on the turtle hatchery idea studied turtle populations to determine their locations, abundance, and food requirements, then designed and built a hatchery with funding from the Fisheries Division, a British fisheries office, and the Foundation for the Peoples of the South Pacific. The hatchery operated as a conservation hatchery -- turtle eggs were collected, hatched, and baby turtles were released into the sea. The

volunteer also conducted classes, made a movie, and had radio programs that dealt with the need for conservation of sea turtles. However, the Fisheries Division was not very interested in conservation, as such -- they were more concerned with the possibilities of future commercial production, and did not support this phase of the volunteer's work. Little material or technical support was given to this project by the Peace Corps, although they did sponsor a meeting with fisheries volunteers and government officials to discuss problems. When the volunteer left, the hatchery was operating well. Encouraged with this success, the Fisheries Division requested another volunteer to work on the next phase of this project, a turtle farm.

The Turtle Farm Project

In 1972 a volunteer was recruited to conduct the feasibility study on establishing a turtle farm. This volunteer and a Samoan counterpart explored turtle breeding grounds and identified possible food sources for sea turtles. In the course of this work, the volunteer and his counterpart went diving beyond the barrier reef. The volunteer was attacked and killed by a shark, and the project was halted.

Two years later Peace Corps recruited another volunteer to continue this work. This volunteer had a degree in marine biology, and did research before his arrival on sea turtles. He discovered that the green turtle, the turtle they wanted to farm, was herbivorous and would not do well under the prevailing conditions. Conditions were more favorable for the production of the hawksbill, a carnivorous species. However, after three months of study the volunteer concluded that farming of this sea turtle would not be possible because the cost of its food was prohibitive. He recommended that Western Samoa look towards other fishery resources for commercial ventures.

The Baitfish Project

After the turtle farm study, this volunteer began exploring the possibility of producing bait to support the development of a commercial skipjack tuna fishery. Live bait was needed for tuna and many other fish species found in Samoan waters, and the bait fish available at that time was too fragile and in short supply. The volunteer designed a technical facility for production of bait fish and requested help from the Peace Corps and from the Food and Agriculture Organization (FAO) of the United Nations. With the help of an interested Peace Corps staff member, he wrote a project paper and received US $1,000 from Peace Corps in Washington to build his facility; some funding also was received from FAO. After one year of work, he was able to get a lease from the government on a one-acre site. The volunteer did not receive any other material support from the Fisheries Division, although he did have a counterpart who left for Japan soon after the volunteer arrived for a training course in deep sea trawling. Finally, the volunteer was able to set up the baitfish hatchery, test it, and begin operation. The project was a success, as evidenced by the fact that three years after the volunteer left, the facility had expanded to two acres of ponds, had a road and electricity, and was run by several well-trained Samoans. The government fishing vessel used the baitfish produced and was able to increase catches substantially.

The Village-level Fisheries Extension Program

The next group of volunteers were requested in 1975 to work in the Village-Level Fisheries Extension Program. With previous experience in mechanics or education in commercial marine fisheries, this group of volunteers was trained in outboard engine repair and maintenance, language, and cross-cultural studies in Hawaii. Originally a group of nine, four left during the

first year. Of the remaining five, four worked in demonstration teams as part of the Village-Level Fisheries Extension Program, while one volunteer was assigned to supervise the turtle hatchery begun by a volunteer in 1971.

The efforts of the Village-Level Fisheries Extension Program were directed into three main phases: maintenance of outboard engines, methodology of harvesting fish, and marketing. Working with Samoan counterparts, the volunteers in this program went from village to village helping train local fishermen in all aspects of engine maintenance and fishing methods. Several of the volunteers worked closely with the baitfish facility set up by a previous volunteer in conducting fishing trials to determine the usefulness of live bait. As a result of the collective work of this group and the baitfish facility, more fish reached the markets than ever before. During the first 18 months this group of volunteers was in the country, the importation of canned fish into Western Samoa dropped significantly.

This increase in the total fish catch prompted the FAO to develop a marketing scheme to utilize the catch, and several volunteers participated in the scheme. The FAO requested the help of additional volunteers and offered to put up US $500,000 to continue the development of this new commercial fishery. The four volunteers involved recommended that Peace Corps comply with this request. However, with the end of their tours in 1977, there were no further requests from the Fisheries Division. Peace Corps/Western Samoa files indicate that the volunteers and the Fisheries Division felt the need for the fisheries extension project had diminished since the two major workshops were operating successfully and sufficient numbers of village fishermen had learned minor repair and maintenance. In addition, Japan was providing volunteers and aid to the project,

thus nullifying the need for continued Peace Corps presence. Since 1977 no marine fisheries volunteers have been requested, although there is some interest in freshwater fisheries at present.

Evaluation of the Project

In an evaluation* done in 1976, the Peace Corps evaluator states that two outboard engine repair stations had been set up and were training Samoans, and that volunteers assigned to the outlying districts were training local fishermen to maintain and operate their engines more efficiently. The evaluation stated that, as a result of these efforts, volunteer assistance would end since there were now trained local people to continue this work. The evaluation further stated that fisheries demonstration teams showing new fishing methods and equipment were established and successful, and that as a result of these efforts there were substantially increased fish catches, although it remained to be seen if this was a permanent change. The evaluation stated that throughout this project there was little support or coordination from the Fisheries Division, possibly because the Director was only an "acting" officer. Most of the support for all of the marine fisheries projects came from outside agencies including the FAO, the South Pacific Commission, the Japanese Overseas Cooperation Volunteers, and the Peace Corps.

Successes and Failures

Overall the Peace Corps marine fisheries projects in Western Samoa are considered successful in that the government's original goals -- to reduce the amount of food imported and develop a commercial fishery -- were achieved. Individual volunteers

*ACTION Evaluation. 1976. Peace Corps/Western Samoa Country Program Evaluation.

also felt that their projects were successful. Factors that may have led to this success include these:

- Although the Fisheries Division was very new and did not have the staff capabilities or funding to provide direct supervision and trained counterparts to all volunteers, the Division did provide support in terms of well-planned programs with definitive objectives, good job sites, free housing and boats and outboard engines. As the programs developed, the Division increased its support to volunteers, including counterparts with fisheries training and some financing.

- Most of the Peace Corps volunteers were chosen for their experience in mechanics or educational background in marine fisheries. The volunteers were given excellent technical, cross-cultural, and language training; those on demonstration teams regularly conversed even with each other in Samoan.

- In the beginning of the program, Peace Corps did not provide any technical support for the marine fisheries volunteers, but as the program developed, a staff member became very interested in all of the projects and was instrumental in getting some of them started. The staff member also served as the liaison between volunteers and the other international organizations that were involved in fisheries development in Western Samoa. According to the volunteers, when the staff member left the country, no one else picked up the marine projects and they simply died.

- In each of these projects, volunteers were used to provide assistance and training to Samoans. As the Samoans became proficient in these tasks, Peace Corps began pulling out. Both the Peace Corps staff and the volunteers felt that the volunteers had literally "worked themselves out of a job" and that Peace Corps assistance was no longer needed in the marine fisheries field.

- The Samoan people had a long history of involvement with fisheries, and were very proud, independent and nationalistic. They were willing to work with the volunteers for their own betterment, and learned quickly. Volunteers often lived in fishing villages and went on all-night fishing trips with local fishermen to demonstrate techniques and equipment. As a result,

> volunteers were accepted and trusted by Samoans. The volunteers themselves felt this was due in part to the fact that they were able to communicate with the Samoans in their own language.

The volunteers felt that there were some failures in their projects. One failure was the inability of several volunteers to convince the Fisheries Division of the need for conservation education in Western Samoa, particularly concerning the two endangered turtle species. There is some question also as to the long-term success of these projects. Although the importation of fish did go down during the first 18 months of the Village-Level Fisheries Extension Program it was not known if this was due to volunteer activities or to some other cause. However, the development of outboard engine repair schools and the improvement of fishing techniques did help Western Samoa to develop a commercial fishery. Thus, the marine fisheries projects in Western Samoa were successful in meeting the original goals of the country.

3. Future of Peace Corps Marine Fisheries Programs

Each of the five case studies in Chapter II concluded with a section called Successes and Failures. In these summaries, points were brought out to illustrate why some projects were successful and others were not. Although each project was different depending upon the given conditions, it is clear that the same kinds of factors influenced each marine fisheries project. Future Peace Corps involvement in marine fisheries programs will depend also upon these factors and on others unique to individual countries. This chapter examines each factor identified in the case studies both to aid in the evaluation of current Peace Corps efforts in marine fisheries and in the planning of future marine fisheries programs. It is hoped that programmers in the field and planners of future Peace Corps programs will benefit from the evaluation of those factors found to be critical to the success of past Peace Corps marine fisheries programs.

Factors That Determine Success

Among the factors that determine the success of Peace Corps programs in marine fisheries are the amount and kind of support given to projects and volunteers from the Peace Corps and the host country government, the qualifications and training of the volunteers, the receptivity of host country people to volunteers and the project, and the previous involvement of host country agencies and local people in marine fisheries. These and other factors influence marine fisheries programs to such an

extent that in many cases, the factors become criteria for determining whether or not Peace Corps should be involved with the program. The following factors should be considered both in the planning of future marine fisheries efforts and in evaluating current Peace Corps programs in the field.

Support from the Host Country

The first criterion to be considered in deciding whether or not Peace Corps should be involved in marine fisheries projects should be the extent of commitment to the project by the host country government. If projects are seen as top priority by the government, it is more likely that money will be allocated for the projects, volunteers will be supported by the agency to which they are assigned, counterparts will be provided, and the necessary materials and equipment will be provided. Part of this commitment should be in planning programs that volunteers will be working in with Peace Corps assistance, identifying the types of positions that volunteers can fill, and ensuring that they are wanted and expected by local staff people. If the country believes the project is important this support will be forthcoming; if not, perhaps Peace Corps should reconsider their involvement in the project.

Support from the Peace Corps

The second consideration for involvement in marine fisheries is the amount of commitment that Peace Corps gives to the project. Peace Corps support starts at the planning stage when staff members meet with host country agency staff to identify possible positions for volunteers in marine fisheries projects, and goes on to the recruitment and training stages of the project. Peace Corps should be as honest as possible about the qualifications of volunteers that they will be able to get, and make sure the host country is aware of this when they request volunteers. Peace Corps overseas staff members

should formulate task analyses based on visits to potential volunteer sites so that volunteers will receive appropriate training for specific jobs. Peace Corps should give potential volunteers a clear picture of the situation in the country regarding the level of technical information needed, exact job descriptions, and amount of support to be expected. Once in training, volunteers should be given technical training that is specific to their job placements. One point that stands out in all of these case studies is that when a local Peace Corps staff member had responsibility for the marine projects and had some technical understanding, projects went much more smoothly. In the same vein, Peace Corps should utilize technical resource people such as consultants or returned fisheries volunteers to plan and evaluate marine fisheries projects in the field. Peace Corps also should be careful not to place volunteers in positions that take jobs away from qualified host country professionals.

Qualifications and Expectations of Volunteers

In the past, volunteers were recruited for specific projects and those with certain skills were selected for community-type work while others were selected for technical work. Volunteers with advanced degrees in the sciences expected to do work that was scientifically useful, and expected to have all the necessary support in terms of equipment and funding to do good research. In some cases volunteers with specialized academic degrees selected by Peace Corps were more concerned with professional advancement in the scientific community than with the traditional Peace Corps experience. When the necessary professional support was not available, many volunteers became frustrated and left. On the other hand, volunteers who had general backgrounds and were trained in fisheries skills felt out of their depth when faced with situations they had not been told about in training. Volunteers who were not trained in

community development theory and methods were resentful when Peace Corps expected them to become involved in their communities outside of their jobs, and even when they tried they had few successes. Peace Corps needs to have clear objectives for volunteers and make sure they understand those objectives. Peace Corps should select volunteers for marine fisheries projects based upon their flexibility and their ability to work in unstructured, ambiguous situations. Volunteers also should have experience or training in community development as well as the appropriate technical skills.

Receptivity of Host Country Nationals to Volunteers

Each country reacts differently to working with Peace Corps, and in many cases such reactions have little to do with the work volunteers do. Local customs and politics can have an important bearing on the potential success of a Peace Corps project and should be considered in project selection and design, and in volunteer recruitment.

History of Host Country's Involvement with Fisheries

The last point to consider when thinking about potential marine fisheries projects is the amount and nature of experience the country has had in the field. Countries that have no history of involvement with marine fisheries, even though receptive to such projects, will have few staff people who can support a project and give direction to volunteers. For example, in Western Samoa the Fisheries Division was set up with the help of a volunteer, but for many years it was not able to give the necessary amounts of support to volunteers because it did not have the funding or staff capabilities to do so. Countries that have had some experience in fisheries may have attitudes towards marine fisheries that were formed by their previous exposure that could influence a project. Fishermen in El Salvador, for example, were not

receptive to volunteers at first because they had had bad experiences with cooperatives. Peace Corps should be aware of these attitudes and make sure that projects take such attitudes into account in the planning stages.

Planning for the Future

From the above discussion of marine fisheries projects, and given the current Peace Corps emphasis on basic human needs, future effort in the marine fisheries area appears to have the most promise in small scale, village-level marine fisheries development programs. Geared towards assisting the artisanal fishermen of coastal areas, such programs would involve volunteers in all aspects of fisheries development including applied fisheries research. To provide a guide for Peace Corps planners, programmers, and trainers this chapter includes the following detailed task analysis for village-level marine fisheries development programs. The task analysis breaks down the tasks that volunteers in such programs would be expected to perform to fulfill the objectives of individual countries and the Peace Corps. It also outlines an inventory of skills around which Peace Corps hopes to develop skill training models in the 1980's. All marine fisheries development workers should be able to perform some combination of the following tasks depending upon their skill training, education, experience, their assignment, the country's development goals, and the status of artisanal fishing in their area. Other tasks may be added as needed that are specific to the particular host country under consideration and to the training needs of individual volunteers.

Task Analysis: Village-level Marine Fisheries Development Programs

Each marine fisheries program will have general goals and expectations of the volunteers involved. In village-level marine fisheries development programs, volunteers will be expected to:

- Establish and maintain good personal and working relationships with host country supervisors, co-workers, and local fishermen.
- Become familiar with the policies, plans, and program goals of their host country agencies and gain an understanding of how their projects fit into national programs.
- Become familiar with the status of marine fisheries development in their areas, and identify problems, concerns, and expectations for their own projects with their supervisors and co-workers.
- Establish objectives and a program of work to accomplish those objectives.
- Develop productive working relationships with people in all agencies that may have an influence upon or could contribute to their project, including local leaders, universities, government agencies, international agencies, and the private sector.
- Identify all the resources in the local area and in their host country agencies and others that may be available to their projects.
- Adhere to the rules, regulations, and policies of their host country agencies, and conduct themselves as full working members of their agencies with all the responsibilities thus conveyed.

Specific tasks that volunteers will be expected to perform in village-level marine fisheries development programs can be divided into the following subjects: fisheries methodology and fishing gear, fisheries research, fish handling, fish marketing and co-operatives, and fisheries education.

Fishing Methodology and Fishing Gear

- Study existing fishing methods, gear, vessels, and fish species utilized by local fishermen.

- Study and determine extent of fishery resources presently utilized, their abundance, and identify possible ways to increase catch of desirable fish and shellfish.

- Evaluate traditional fishing vessels and other boat designs to determine value of introducing new boats or modifying existing ones for better fishing gear.

- Develop new methods or modify existing fishing methods to increase fish catch per unit effort.

- Introduce new gear and demonstrate its use, construction, and repair. Gear and new fishing methods that might be introduced include the following:

  Line fishing - hand lines, long lines, floating lines, trolling

  Trap fishing - fish pots and traps, shellfish pots and traps

  Encircling gear - purse seines, beach seines

  Net fishing - dip or lift nets, gill or trange nets, trammel nets for fish and lobster

  Dredge and trawl fishing - shellfish dredges, bottom trawl for fish and shrimp

- Introduce outboard and inboard engines and teach proper mounting of engines, operation, repair and maintenance.

- Teach fishing safety procedures such as boat handling and equipment to take for emergencies - paddles or oars, a light, food, and water.

Fisheries Research

- Survey and collect data on local fish and shellfish species presently being utilized and identify potential fishery resources not presently utilized.

- Evaluate inshore and offshore environments for their potential for protecting and promoting important fish and shellfish species.

- Identify the distribution and relative abundance of important fish and shellfish species, to determine the need for resource management and conservation programs.

- Study the life history and identify the different life stages of important fish and shellfish species to determine the appropriateness of different fishing methods and gear and the need for moratoria on fishing at certain times of the year or in certain spawning areas.

- Teach counterparts and local fishermen the importance of resource management and conservation and help them determine how best to manage their own local fishery resources.

Fish Handling

- Study existing methods of fish handling, preservation, and processing and identify local preferences as to size, condition of fish sold, and freshness of fish desired.

- Identify the types of fish processing and preservation available to local people and their reactions to each type.

- Introduce new methods of fish preservation that use locally available materials and skills. Such methods could include:

  Salting - either between layers of salt, or in a brine solution
  Smoking - in small quantities for household use
  Drying - cheapest, uses sunlight and little else, but fish must be gutted
  Icing - maintains freshness of fish over short periods of time from boat to market, but requires ice plants (electricity)

- Explore the possibility of processing fish on an industrial scale, such as canning and freezing.

- Teach general health practices with regard to fish preservation and handling, including quality control and sanitation.

Fish Marketing and Cooperatives

- Study current fish marketing methods, location of markets, availability of transportation from docking areas to markets, and methods of fish distribution (by fishermen themselves? by middlemen who buy at the dock?).

- Identify other marketing methods that may be possible in the local area and locate potential markets for fish that have not been utilized previously.

- Locate and determine need for credit and financing to improve present marketing methods.

- Help fishermen develop associations or cooperatives if none are in operation for fish marketing and financing for new gear and boats.

- Provide assistance in administration, bookkeeping, and accounting for associations and cooperatives, and educate cooperative members in such activities.

- Collect data on fish sold, prices obtained, size preferred, quality of fish when sold, types of fish eaten, and other statistical information to determine where improvements are most needed.

- Prepare feasibility studies for new markets and design new facilities for marketing needs such as ice plants and storage areas in cooperative buildings.

- Identify local businesses and buisnessmen who are interested in either financing marketing facilities or in buying fish directly from fishermen and who can provide technical help to fishermen.

Fisheries Education

- Conduct nonformal fisheries education of counterparts, coworkers, and local fishermen in all of the above fields when undertaking the appropriate activities.

- Utilize local resources to promote eating of fish through audiovisual and written materials such as films and posters.

- Give talks to school children about the fishery resources of their area and the importance of protecting fish now so that there will be fish in the future.

- Work with health and nutrition volunteers in developing new ways to cook fish and introducing new fishery resources to local people.

- Develop an awareness of fisheries resources locally through newsletters, radio programs, and other types of information exchange.

- Where feasible, work with local fisheries technical schools and colleges to give practical, hands-on fishing experience to students. Allow local fishermen to demonstrate and lecture on new gear and methods and let them answer questions from students.

Appendix A: Limitations of Data

Most of the background information used in developing the material presented in the case studies was found in Peace Corps files, including those of the Office of Programming and Training Coordination, country desk officers, and the ACTION Library. Some materials were received from returned Peace Corps volunteers involved in those projects studied as well. Most of the statements made in evaluating success and failure of Peace Corps marine fisheries projects came from Peace Corps evaluations; however, some statements made are based upon the perceptions of returned volunteers themselves, especially when no formal evaluations were ever made. Perceptions change over time, and most volunteers contacted agreed that they were perhaps remembering only the very good or very bad aspects of their tours. Thus these case studies should not be considered as the final verdict in any case, but as the perceptions of evaluators, programmers, trainers, staff, and volunteers involved in marine fisheries projects. There were also gaps in the data that could not be filled.

Data from returned volunteers was gathered through telephone conversations and letters. Volunteers were asked questions to start their thinking about projects, some of which occurred 18 years ago. Others merely talked about projects, giving their own views with little prompting from the researchers. A sample questionnaire used for this purpose follows.

Questions for Marine Fisheries RPCVs

1. How many volunteers were in your project? At the beginning? At the end of two years?
2. What pre-Peace Corps education, training, and experience in marine fisherics did you have?
3. What training did you have prior to placement in-country?

4. What was your primary job as a volunteer? Your secondary job?

5. Did your project have clearly defined objectives? Did you know what these were?

6. What were the objectives of the project? Were PC objectives the same as those of the host country?

7. Was there support for the project? From PC? From the host country government? What kind of support:

   a. counterparts
   b. place to work
   c. money
   d. transportation
   e. housing
   f. equipment
   g. supervision and direction

8. If not working for the government, who provided support and guidance for your project?

9. Where did you live? Work? Within what radius of your living quarters/work place did you travel for work purposes? How far did you travel from your living quarters to your place of work? Did your living arrangement influence your job performance?

10. Did you complete your project? Why did you and other volunteers in your program leave the project:

    a. normal termination
    b. medical reasons
    c. personal reasons
    d. project deficiencies
    e. other problems

11. Did you perceive problems during the course of the project? If so, did you make recommendations to the Peace Corps? To the host country government?

12. Were such recommendations acted upon? Did such actions improve the situation? Why or why not?

13. Did you have enough to do? Was your job dependent upon outside support?

14. In your opinion, did the project fulfill original objectives of PC? Of the host country government? Why or why not? How?

15. If not, what were the problems?

    a. no need for project as defined
    b. personal problems
    c. medical problems
    d. unavoidable "chance" problems (i.e. political)
    e. lack of support - money, equipment, trained counterparts
    f. lack of receptivity on part of target audience (fishermen, farmers, etc.)
    g. inability of volunteer to communicate - language, cross-cultural issues, technically unqualified, personality problems
    h. other problems

16. What was your group's feelings about continuing the project in your country? In another country? What is your feeling about this?

17. Do you consider the project successful? What do you mean by successful? If not, under what circumstances could the project have been successful?

18. Is the project still going on? If not, why do you think it stopped?

19. Any further comments on training, abilities of volunteers to do the job, support from PC, host country, private donor organizations, other volunteers, and evaluations of PC projects.

20. Can you suggest other people in your program who should be contacted for information?

Appendix B: List of All Past Peace Corps Marine Fisheries Projects

Africa

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
Kenya	1965	University/ Museum (individual placements)	small	10-13 years	?
	1972/74	Smithsonian/ Research (individual placement)	4-6 PCVs	4 years	
Mauritius	1972	Smithsonian/ Research	3-5 PCVs	4 years	No program
	1972	fishery cooperatives	3-5 PCVs	4 years	No program

Africa

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
Morocco	1973	research (individual placements)	few	4-5 years	phased out
Senegal	1968	fish cooperatives	small	3 years	discontinued
Sierra Leone	1964	fish extension	5 PCVs	1 year	discontinued
	1972-73	fish technology	2-3 PCVs	2-3 years	phased out
Togo	1962	fish extension	3-8 PCVs	1964-65	discontinued

SOL

Asia and the Pacific

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
Fiji	1970	fishery cooperative	4 PCVs	1-2 years	phased out
		technicians and PC/Smithsonian volunteers (individual placements)	small	4-5 years	gradual phasing out with 1-2 PCVs at present working as marine technicians
Iran	1968	Research - pollution resource management with Smithsonian aid	20-30 PCVs	7 years	terminated
Malaysia	1963	fishery research extension	8 PCVs	10 years	
	1976	marine technology (individual placement)	1 PCV	2 years	terminated
	1977	mariculture	5 PCVs		phased out

Asia and the Pacific

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
Micronesia	1966	fish marketing	53 PCVs	7-9	phased out
	1967	fish research	23 PCVs	6-8 years	phased out
	1968	fish cooperative	15 PCVs	5-7 years	phased out
	1973	mariculture/ marine technicians/ fish pond developers (special placements)	few	4-5 years	phased out
Philippines	1973	planning/extension/research marine technology	30 PCVs	6 years	active
Solomon Islands	1973	Smithsonian/ mariculture (individual placement)	small	6 years	
Tonga	1972	research (individual placements)	5-7 PCVs	7 years	active

Asia and the Pacific

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
W. Samoa	1970	cooperatives/ research technology	14-20 PCVs	5 years	active but reduced
	1975	marine technology	4-5 PCVs	4 years	active but reduced

Latin America and the Caribbean

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
Belize	1962	cooperatives	2 PCVs	2 years	
	1970	coop/research (individual placement)	small	to present	active
Brazil	1966	fish colonies & cooperatives	large (60-80PCVs)	10 years	phased out
	1972	research (individual placement)	small	4-5 years	phased out

Latin America and the Caribbean

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
Chile	1966	cooperatives	large (60)	7 years	discontinued
	1969	fishery research	10-15	6/8 years	discontinued
	1974	high skilled fish research	15-20	3 years	discontinued
	1977-78	fishery extension	15-20	2 years	phasing out
Colombia	mid-60's	cooperatives	small (3-5)	sporadic	
	1973	marine research (individual placement)	small (3-5)	4-5 years	phased out
Costa Rica	1968	CARFDP* University/ Cooperatives	6 PCVs	3 years	phased out
Dominican Republic	1964	fishery extension	3-11 PCVs	2 years	discontinued
	1975	cooperatives	2-3 PCVs	1975-present	active

* CARFDP = Central American Regional Fisheries Development Project

Latin America and the Caribbean

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
E. Caribbean	1976	marine technology (individual placement)	1 PCV	2 years	active
Ecuador	1974	marine technology	1 PCV	2 years	
El Salvador	1968	CARFDP* cooperatives	20-75 PCVs	11 years	phased out
Guatemala	1968	CARFDP* fishery extension	10 PCVs	3 years	
Honduras	1968	CARFDP*	10 PCVs	8 years	phased out
Jamaica	1965	cooperatives	7 PCVs	3 years	phased out
Nicaragua	1968	CARFDP*	6 PCVs	1-2 years	terminated
Panama	1966	cooperatives	3-5 PCVs	6 years	PC Program Terminated
	1968	CARFDP*	10 PCVs	4 years	PC Program Terminated

* CARFDP = Central American Regional Fisheries Development Project

Latin America and the Caribbean

Country	Date of Initiation	Type of Program	Size	Duration	Present Status
Peru			No appropriate documentation		

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Loret Miller Ruppe, Director
Edward Curran, Deputy Director Designate
Richard B. Abell, Director, Office of Program Development

Peace Corps overseas offices:

BELIZE
P.O. Box 487
Belize City

BENIN
BP 971
Cotonou

BOTSWANA
P.O. Box 93
Gaborone

CAMEROON
BP 817
Yaounde

CENTRAL AFRICAN REPUBLIC
BP 1080
Bangui

COSTA RICA
Apartado Postal
1266
San Jose

DOMINICAN REPUBLIC
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1414
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Barbados, Grenada,
Montserrat,
St. Kitts-Nevis,
St.Lucia,St.
Vincent, Dominica
"Erin Court"
Bishops Court Hill
P.O. Box 696-C
Bridgetown, Barbados

ECUADOR
Casilla 635-A
Quito

FIJI
P.O. Box 1094
Suva

GABON
BP 2098
Libreville

GAMBIA, The
P.O. Box 582
Banjul

GHANA
P.O. Box 5796
Accra (North)

GUATEMALA
6a Avenida 1-46
Zona 2
Guatemala

HONDURAS
Apartado Postal
C-51
Tegucigalpa

JAMAICA
9 Musgrove Avenue
Kingston 10

KENYA
P.O. Box 30518
Nairobi

LESOTHO
P.O. Box 554
Maseru

LIBERIA
Box 707
Monrovia

MALAWI
Box 208
Lilongwe

MALAYSIA
177 Jalan Raja Muda
Kuala Lumpur

MALI
BP 85
Bamako

MAURITANIA
BP 222
Nouakchott

MICRONESIA
P.O. Box 331
Saipan, Mariana
Islands

MOROCCO
1, Zanquat Benzerte
Rahat

NEPAL
P.O. Box 613
Kathmandu

NIGER
BP 10537
Niamey

OMAN
P.O. Box 966
Muscat

PAPUA NEW GUINEA
P.O. Box 1790
Boroko

PARAGUAY
c/o American Embassy
Asuncion

PHILIPPINES
P.O. Box 7013
Manila

RWANDA
c/o American Embassy
Kigali

SENEGAL
BP 2534
Dakar

SEYCHELLES
Box 564
Victoria

SIERRA LEONE
Private Mail Bag
Freetown

SOLOMON ISLANDS
P.O. Box 547
Honiara

SWAZILAND
P.O. Box 362
Mbabane

TANZANIA
Box 9123
Dar es Salaam

THAILAND
42 Soi Somprasong 2
Petchburi Road
Bangkok 4

TOGO
BP 3194
Lome

TONGA
BP 147
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TUNISIA
B.P. 96
1002 Tunis-Belvedere
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Ouagadougou

WESTERN SAMOA
P.O. Box 880
Apia

YEMEN
P.O. Box 1151
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